THE IRON AGE

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THE IRON AGE

THURSDAY, APRIL 7, 1892.

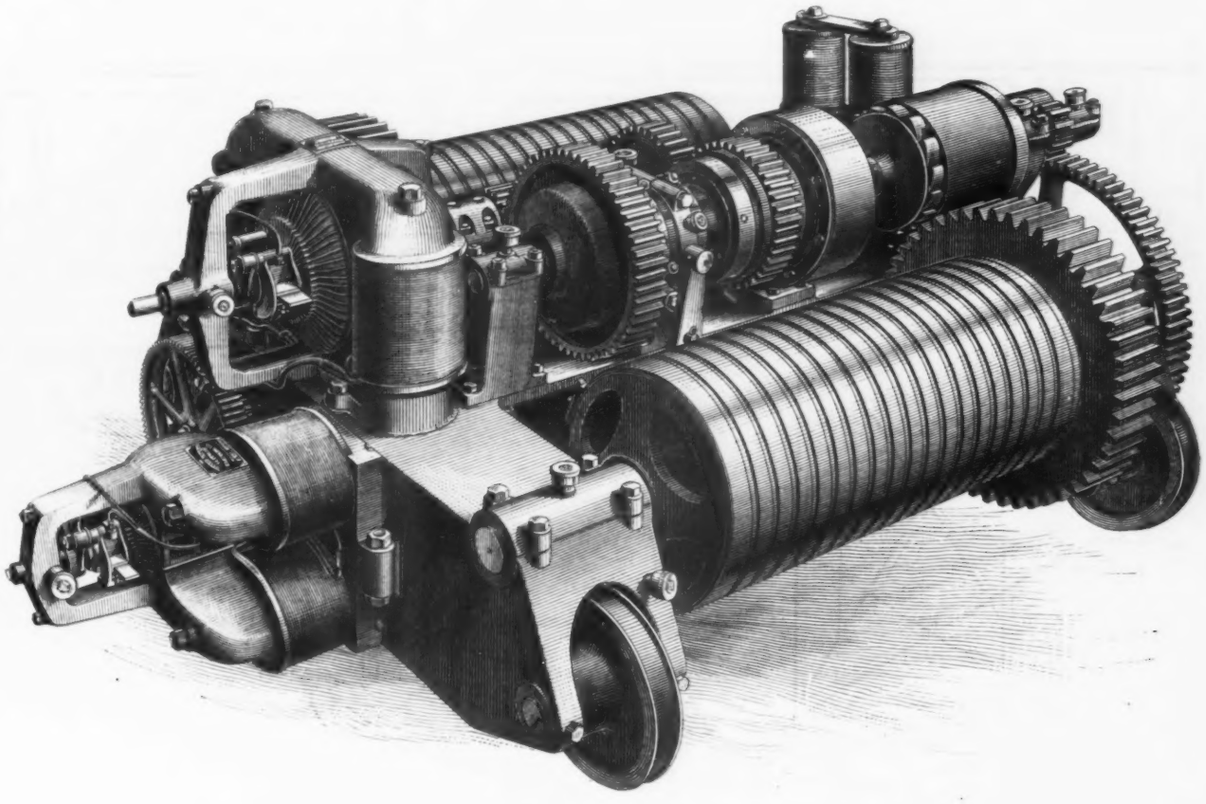
The Shaw Electric Traveling Crane.

During the past two or three years the electric traveling crane has been widely introduced in mills, foundries and machine shops, as it has been found to possess many advantages over the old method of driving by means of a square shaft. The fact that the electric current for operating the motors carried by the crane can be conveyed without trouble from the dynamo to the bridge, and that when there is no work being done there is no expenditure of power, are points well known and appreciated. Not the least essential feature is the total absence of noise. All mechanically driven cranes have certain predetermined speeds of travel and hoist which cannot be varied; the electric crane, however, has an indefinite number, and any movement can be gradually and smoothly accelerated or retarded or maintained at any speed between the highest and lowest at the will of the operator. Further than this, the electric crane has proved to be reliable in all locations, even the dirt of a foundry causing no trouble.

Probably the first triple motor crane put in practical operation anywhere was built from the designs of A. J. Shaw by the E. P. Allis Company and erected in their foundry in Milwaukee. Although this was an experimental machine and somewhat crude in many of its details it was pronounced superior to anything previously introduced. The molders were especially pleased with it, as it was far smoother and steadier in its movements and capable of much more accurate handling than the power cranes in use at that time.

From the accompanying engravings an idea of the general arrangement of the Shaw electric crane can be obtained. Fig. 1 is a perspective view of the trolley; Fig. 2, a side elevation of one end of a 60-ton double trolley crane, having a span of 60 feet, Fig. 3 being a cross section through Fig. 2. The last drawing is a plan view of the trolley of a 15-ton crane. The bridge is moved along its tracks by means of a motor placed near one end, as shown in Fig. 2, the power of which is transmitted through suitable gearing to the driving wheels at each end. The trolley carries two motors, located at one side, as indicated in the perspective view, one of which is arranged to move the trolley along the bridge while the other is so geared as to operate the hoisting drums. This crane, as are all built by this company, is fitted with duplex automatic brakes, to which in large part is due the accuracy with which the load can be handled in hoisting and lowering. These brakes not only insure against the accidental dropping of the load from any cause other than breakage of parts, but positively prevent any possibility of racing in lowering. They are entirely automatic in their operation, and do not depend for their action on the skill or vigilance of the operator. One of them, the mechanical brake, is applied continuously by the reaction of the load itself, the force with which it is applied being proportional to and increasing with the load, and released by the pull of the motor. The other is applied by a powerful spring, and is always "on" except when withdrawn by the action of a solenoid in series with the hoisting motor. Without the mechanical brake the crane would race in lowering, as the magnetic brake is then withdrawn by the current actuating the motor, and both the motor and load act in the same direction. Without the magnetic brake the load could not be stopped promptly after either hoisting or lowering, on account of the momentum of the armature. Without the capability of instantly checking the movement of the load, accurate handling would be impossible, as when the current is thrown off it would always go a little too far or not far enough. The two brakes acting in combination give great accuracy of control, which, together with the extremely slow speed at which the crane may be run, enable the heaviest loads within the capacity of the crane to be set with the greatest accuracy.

All the truck wheels are cast from charcoal iron and the treads are chilled deep and hard and ground true. The shafts are large and the bearings unusually long. The machinery is so arranged that all parts are easy of access, and all important details can be removed and replaced without disturbing other parts. These cranes are built by the Shaw Electric Crane Company of Muskegon, Mich., the sole agents for whom are Manning, Maxwell & Moore of New York and Chicago.



TROLLEY OF THE SHAW ELECTRIC TRAVELING CRANE.

In his annual report for 1891, which has just been issued, President Perkins of the Chicago, Burlington and Quincy Railroad Company deplores the effects of the Interstate Commerce act. He says: It will be seen that, owing to the abundant crops of 1891, we were able to earn something over the dividends for the year, which amounted, however, to only 4½ per cent. on the capital of the company. The arrangements made among the railroads for the maintenance of rates have helped to prevent serious reductions, but such ar-

rangements are uncertain and far from satisfactory, owing to the bad effects of the Interstate Commerce law, which have been frequently referred to and discussed in our annual reports. If the country and the cities continue to grow in population and business, it is in spite of unwise laws not because of them; but as most persons do not and cannot take the time for any careful and connected investigation of the subject this property, which is the result of other causes, and which would be greater if no such laws were enacted, is often thought to be directly due to them.

being to provide a quick delivery of large and heavy loads, as in the case of coal, with one man to a wagon.

Subsidies for Steamship Lines.

The absence of the American flag from the great seaports of the world, while other commercial nations are growing in maritime importance, forms the subject of remark by President Chas. S. Smith, of the New York Chamber of Commerce, who argues strongly in favor of encouraging

er from Vancouver to Chica, and a few to Japan. They were taken away from American railroads, where they used to go. They used to go across the continent by the Union Pacific and by the Pacific Mail. The reason for that is to be found in the simple word 'subsidy.' The Pacific Mail steamers for years have got less than $50,000 for postage. The English line gets a subsidy of £250,000. You were asking the Pacific Mail Company, who were practically private owners, to compete with a great government. That never can be done. England grants no subsi-

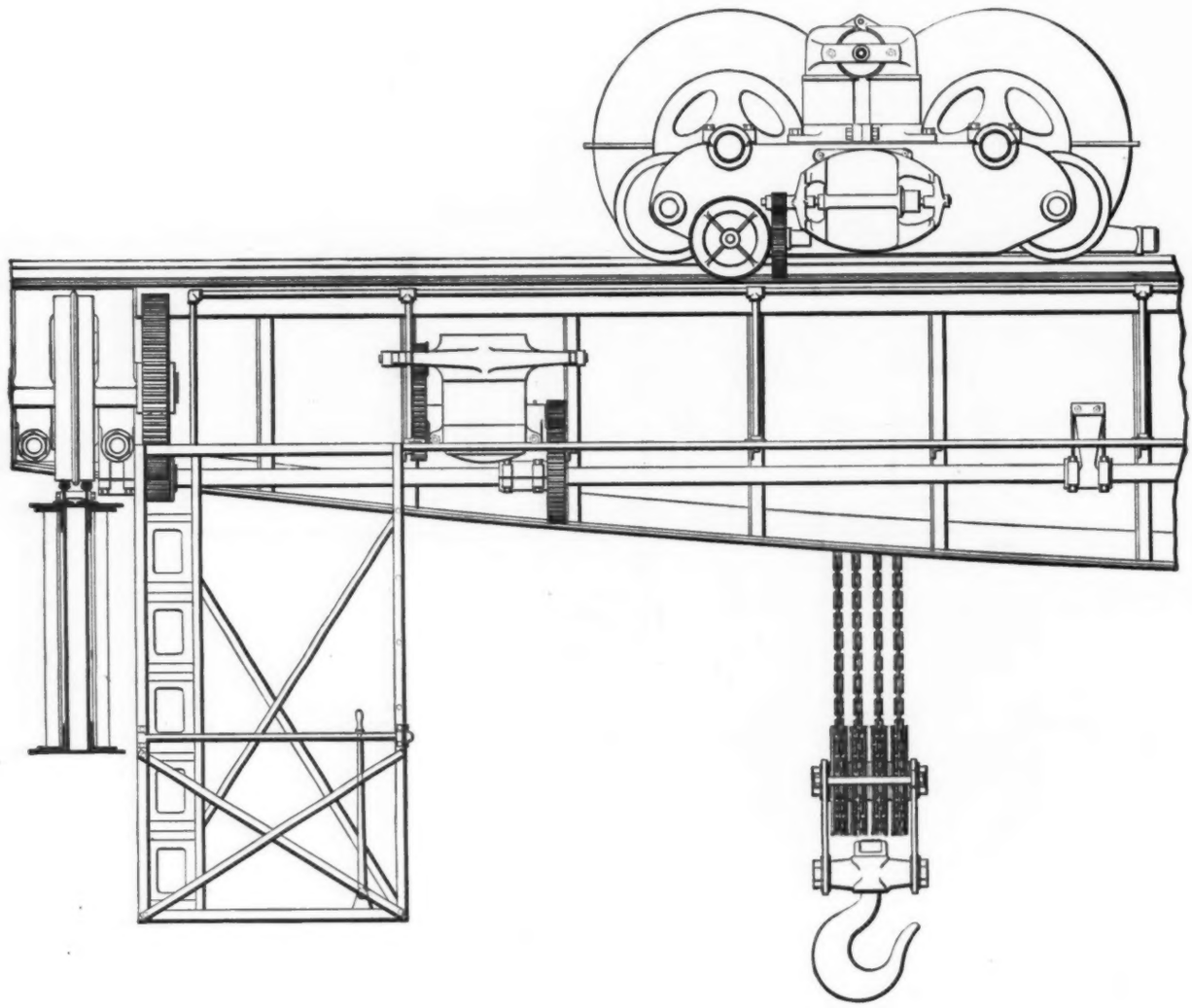


Fig. 2.—Side Elevation of One End of Bridge.

THE SHAW ELECTRIC TRAVELING CRANE.

It is as certain that national and State interference by statute with the natural laws of commerce must bear bad fruit as it is that in the long run the natural laws will prevail.

William H. Sheldon of Poughkeepsie, N. Y., has secured patents on two inventions. The first is a king-bolt for vehicles, which does not weaken the axle or bolster by passing through any part of either. The new bolt affords a simple means of attaching a king-bolt to axle and bolster for use with any style of ordinary fifth-wheel or circle and is especially applicable to vehicles drawing heavy loads and such as are used for carrying coal or other heavy weights. The second invention is an improved delivery wagon with an opening in the bottom of the vehicle with delivery spouts attached, the whole operated by convenient lever appliances, the object

steamship lines, and made special inquiries respecting the operations of the subsidy system while on his recent trip to Mexico and the Pacific coast. He says:

In San Francisco, and in fact generally along the way on the Pacific Coast, we did not hesitate to express ourselves on the subject of the importance of subsidies. I said to them a few words, particularly in San Francisco, in substance as follows: "About an eighth to a tenth of all our productions, when I was a dry goods commission merchant in New York a few years ago, were shipped to China. The amount is larger now. Last year we shipped, I think, from New England and the South about $7,000,000 worth of plain cotton goods, competing with England. We did it at a little profit, nothwithstanding we paid more for labor in the production of the same goods. Every bale of these goods went by the Canadian Pacific and by an English steam-

dies; she does not like that word. She arranges it in a little different way to avoid the disagreeable sound. She says to a company: 'You establish a line to a certain place,' as they did to New York, 'and we will give you so much for carrying the mails until such a time as the business increases and you can afford to get along without this subsidy.' That has been the policy of Great Britain with every line of steamers she has established for the last 40 years.

"We complain in this country that there is not a single steamer carrying the American flag on the North Atlantic between New York and any seaport in Europe. You may go all over the world (and I have been a considerable traveler in my life), and you do not see the American flag anywhere in any foreign port after you leave New York. A friend of mine in the grocery trade, told me a story. One of his customers, a small grocer, who had

been buying his goods on 30 days' time, came to him and said he wanted four months. My friend said to him: 'Why do you want four months?' The little grocer said: 'I have got to buy a horse and wagon. My neighbor, who is my competitor, has bought a horse and wagon and he delivers his groceries. I shall lose all my customers unless I deliver mine in the same way.' That is the secret of the whole thing. You cannot sell your goods unless you deliver them; you have got to have the wagon. In the case of ocean traffic, you have got to subsidize the steamers until such a time as the trade pays them to run, or you'll not have them at all."

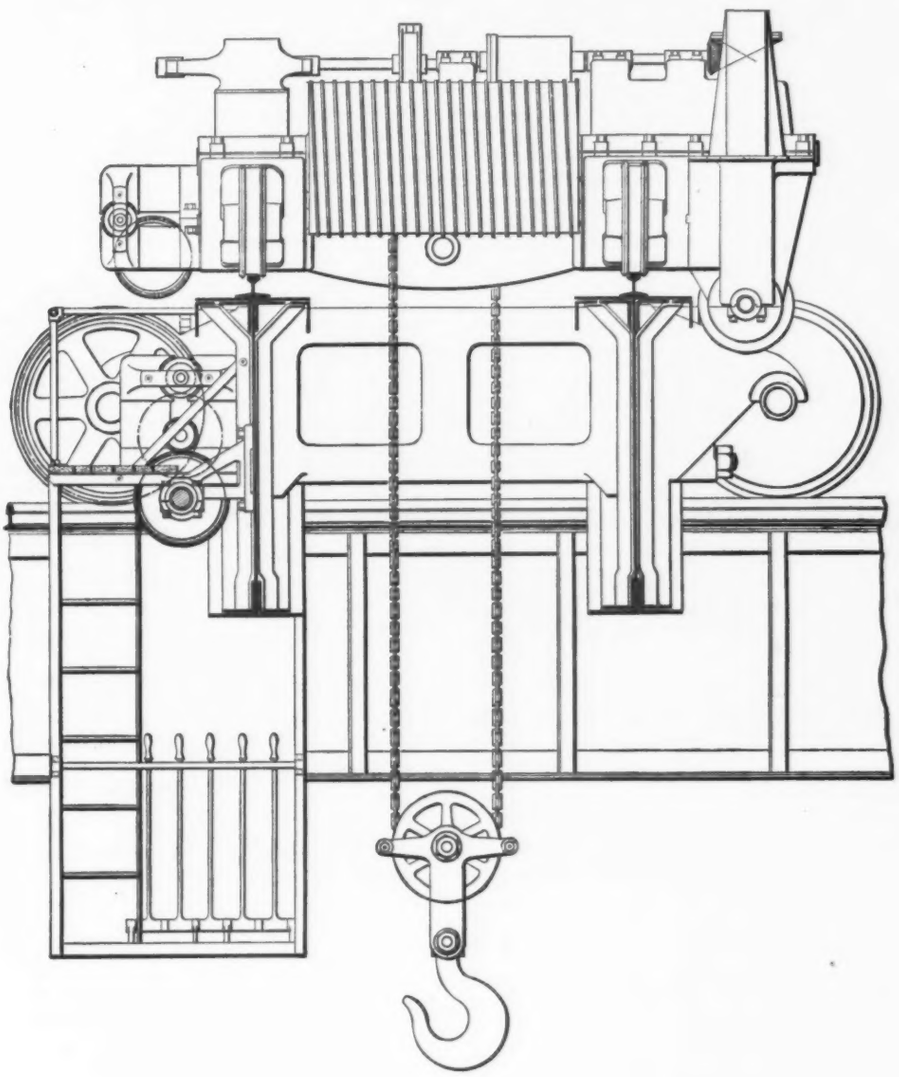


Fig. 3.—Cross Section through Bridge and Trolley.

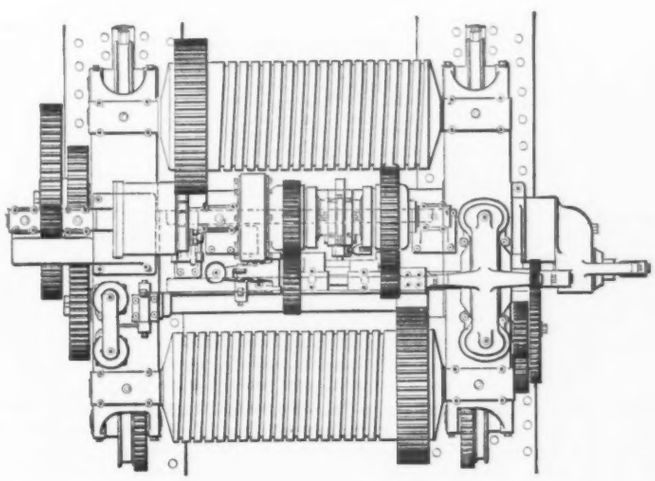


Fig. 4.—Plan View of Trolley.

THE SHAW ELECTRIC TRAVELING CRANE.

The Shultz Belting Company, St. Louis, Mo., are at present engaged in making what is undoubtedly one of the largest belts ever turned out in the United States. The belt in question will be, when completed, 72 inches wide and 135 feet long, and is being made for the Amoskeag Mfg. Company, Manchester, N. H. The belt it $\frac{4}{5}$ inch in thickness, and when finished will weigh close to 2000 pounds.

The Philadelphia *Press* has a dispatch from London, of the 2d inst., stating that an important contract was signed this week by the Russian Government with the Harvey Steel Armor Works of America. Their process for treating plate armor makes it 40 per cent. more impenetrable to projectiles than any other treatment so far discovered. A Harvey plant will be erected immediately at the Aboukoff Armor Works, 10 miles from St. Petersburg, where American steel armor will be made for Russian ironclads. The Russian Government is not putting up this plant as a tentative thing, but to carry out a specific contract entered into by Government officials.

Centrifugal Force.

AS APPLIED TO REVOLVING MACHINERY.

BY G. D. HISCOX.

The disposition and strength of iron or other material, in regard to the tensional force of revolution, is a most important matter for consideration in the designing of all machinery intended for revolution at high speeds, and is especially important as a speed-limiting factor for the fly wheels of steam and other engines, pulleys, grindstones, emery wheels and sectional circular saws.

It has been stated by authors that 80 feet rim velocity per second was the safe limit for fly wheels, while others claim practical figures all the way up to 170 feet rim velocity, without alluding to the possibilities of overrating by sectional structure. Granting that the higher velocities may be attained with solid rims of good metal, the case is very different with sectionalized wheels of large dimensions, where the keying or bolting together of the sections involves a loss in strength due to the whole area of metal section. For although bolts may be made of equal strength with the sectional area, there will always be weak points by displacement to accommodate the bolts or dowel keys, that should have the most careful consideration in the factor of safety for the assigned speed. It must always be remembered that the total strength due to the force of revolution must be measured by the weakest point in the wheel rim.

The resistance to deflection from a right line of motion that is offered by a body making one revolution in a minute in a circle of 1 foot radius was found to be 0.000341 of its own weight, and it thus becomes a prime factor in the computation of centrifugal force in revolving bodies. Since this force increases as the square of the radius and also as the square of the number of revolutions per minute, these components, together with the weight of a sectional square inch of the material, of a length equal to the entire circumference of the rim, become the basis of the formula given by Clark, Molesworth and others; viz.: $0.000341\ W\ r\ n^2$ = the total centrifugal force in a revolving body or rim. In the case of flywheels, W = the weight of 1 square inch of section of the whole rim, and the reduction gives the total centrifugal force for 1 square inch of section; this multiplied by the area of the sectional area of the rim gives the total centrifugal force of the whole rim.

The weight in a cast-iron rim may be taken as 0.26 pound for each circumferential cubic inch. r = the radius in feet to center of rim. n^2 = the square of the number of revolutions per minute.

The fundamental formula for centrifugal force is derived from the force of gravity as illustrated in planetary motion and is expressed by the following notation: $\frac{W \times V^2}{g \times r}$ = the total centrifugal force of a planetary body; in which W may be the weight in units of force or pounds, V^2 the volocity of the circle of gyration in feet per second, g gravity, or 32.166, and r the radius of the circle of gyration in units of measure or feet; the circle of gyration being the circle of revolution passing through the center of gravity of the revolving body.

For a fly wheel or pulley this may be taken as the center of a section of the rim without material error.

In computing the element of tensional strain in the material composing a revolving ring, as a fly wheel or pulley, it is proper to take into consideration the peripheral equilibrium at the terminal points of any diameter, and to so divide the total centrifugal force that the true strain on the metal at two opposite points in the circumference may be ascertained.

For this purpose let Fig. 1 represent any cylindrical vessel subjected to internal pressure, as a steam boiler, a cylinder or pipe in which pressure is generated through the means of a fluid or elastic body. It is evident that the force becomes radial and equal to the pressure per square inch on every inch in the circumference and that the total pressure is equal to the gauge pressure multiplied by the number of inches in the circumference, and that this sum represents the total pressure on each longitudinal inch of the cylinder. This corresponds with the radial nature of centrifugal force; both requiring the same solution for obtaining the final strain on the metal forming the resisting element.

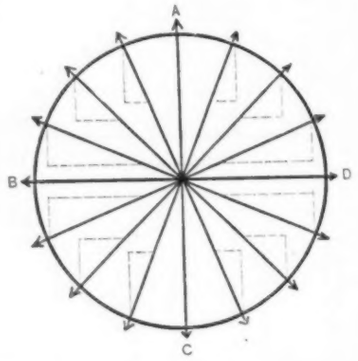


Diagram Showing Resolution of Centrifugal Force.

Again referring to Fig. 1, the tension on the metal in resisting the internal pressure through any particular section, as B D, is equal to the sum of the radial pressures resolved into the direction at right angles to B D, or parallel to the strain in the metal at any two points, B D, and in the direction of A C.

This by the resolution of forces, as shown by the dotted half parallelograms in the figure, is found to be the same proportion as the circumference bears to the diameter. Hence, the total circumferential pressure divided by 3.1416 equals the total pressure at right angles to the diameter B D in the same terms; and as the resistance of the metal is exerted at each end of the diametric line. Then to obtain the strain on one side of a cylinder, fly wheel or pulley, a further division by 2 gives the total strain on a unit of metal on one side. In revolving wheels this is usually a section of 1 square inch. In the last formula, by substituting the weight of 1 cubic inch of cast iron (0.26) for W, and multiplying by the radius in inches, we get the actual strain in 1 square inch of the rim. Making S = to the stress per square inch of rim,

then $S = \frac{W \times V^2}{g \times r} \times 12\ r$, and reducing,

$S = \frac{12 \times W X V^2}{g}$, and by substituting for W the weight of 1 cubic inch of cast iron, and V^2 = the square of the velocity of rim in feet per second, we have

$S = \frac{12 \times 0.26 \times V^2}{32.166}$ and again reducing to lower terms, $S = 0.097 \times V^2$.

Another and perhaps a more easily worked formula for the actual strain per square inch of section in the rim is derived from the last by using the expression $\left(\frac{D,\ 3.1416\ N}{60\ \text{seconds.}}\right)^2 \times 0.097 = \text{strain}$, D being the diameter in feet, N the revolutions per minute. By reducing this to its lowest terms we have $(D \times N)^2 \times 0.0002659 = \text{strain}$, and with this formula we have computed the actual strain per square inch of section for fly wheels and pulleys of various sizes and speeds.

In the table, the figures at the bottom of each column indicate a reasonable limit of strain due to a factor of safety of six for ordinary solid cast-iron fly wheels and pulleys.

For obtaining the total strain between any two segments of a sectionalized fly wheel or pulley, multiply the amount in the table at the intersection of the columns of speed with the lines of diameter by the area of the rim in square inches, which gives the total strain that must be provided for by the bolts, dowels or links that fasten the rim together; not forgetting that any mortices or recesses for bolts or keys should be allowed for in the factor of safety by making a proper proportion between the assigned limit of velocity for a full-strength rim and the reduced strength due to sectionalizing.

STRAINS IN FLY WHEELS AND PULLEYS.

Actual Strain per Square Inch of Section of Fly Wheels and Pulleys with a Safe Factor Limit, at the last Intersection of the Lines of Diameter and Columns of Revolution.

Diameter.	Revolutions per minute.											
ft.	75	100	125	150	175	200	225	250	300	350	400	500
2	5.98	10.63	16.62	23.93	32.57	42.54	53.85	66.48	95.73	130.30	170.19	265.92
4	23.93	42.54	66.48	95.73	130.30	170.19	215.40	265.92	382.92	521.22	684.76	1063.70
6	53.84	95.73	149.58	215.37	293.19	382.86	484.65	598.33	861.57	1172.76	1531.71	2393.32
8	95.72	170.19	265.92	382.89	521.22	680.78	861.66	1063.70	1531.68	2084.90	2739.04	.....
10	149.56	265.92	415.50	598.27	814.41	1063.72	1346.28	1662.03	2393.32	.....	.....	.....
12	215.38	382.92	598.33	861.51	1172.75	1531.76	1938.60	2393.32	.....	.....	.....	.....
14	293.15	521.21	814.39	1172.61	1596.25	2084.90	2638.71	.....	.....	.....	.....	.....
16	382.89	684.76	1063.70	1531.58	2084.90	2723.13	.....	.....	.....	.....	.....	.....
18	484.60	861.59	1346.24	1938.41	2638.71	.....	.....	.....	.....	.....	.....	.....
20	598.27	1063.70	1662.03	2393.32	.....	.....	.....	.....	.....	.....	.....	.....
22	723.91	1287.07	2011.05	2895.65	.....	.....	.....	.....	.....	.....	.....	.....
24	861.52	1531.68	2393.32	.....	.....	.....	.....	.....	.....	.....	.....	.....
26	1011.08	1797.65	2808.83	.....	.....	.....	.....	.....	.....	.....	.....	.....
28	1172.61	2084.85	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
30	1346.12	2393.11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
32	1531.58	2739.04	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

This point is a most vital one in the designing of large segmental fly wheels and suggests an axiom, that the rim fastenings in a sectionalized fly wheel or large pulley should of necessity be made as near to the total strength of the mass in the rim as possible; not necessarily for the assigned speed alone, but for the possibilities of runaway accidents.

The arms of fly wheels should not only have a symmetrical form of stability, suitable to the size and weight of their rims, but should also have a form for strength near the hub with a liberal factor of safety, to meet the thrust of the piston at the point of its greatest pressure upon the arms.

The stress at this moment becomes greatest in large belt fly wheels when transmitting the whole power of the engine at their periphery. In such the whole strain of transmission is thrown upon the arms with all the force of the piston pressure, varying from 0 to an amount equal in some cases to the initial gross piston pressure with a late cut-off.

The gyratory action of a fly wheel, or the disposition of the crank thrust to produce a wabbling motion of the rim, and the resistance to such action by the stability in the plane of motion of the mass of the rim, is perhaps of little moment in a new engine, in which the boxes are well adjusted and perfect in form, but is a growing source of mistrust and danger from the wear and neglect of the main journal boxes to the extent that the thrust of the piston causes a lateral movement of the shaft at the crank end in the direction of thrust and in the opposite direction in the off bearing for each stroke.

This movement, however small, must be taken up in the spring of the arms, or the whole rim must assume a wabbling motion. This induces a disintegrating action leading to dangerous conditions according to the extent of the movement. The remedy with the designer is in adjustable sectional journal boxes, and with the engineer watchfulness and a sense of responsibility in keeping the running parts of an engine up to its normal condition.

Grindstones

when of large dimensions and running at high speeds are a constant source of apprehension, and have too frequently been destructive to life and property by following the course of nature when overtaxed. Apart from the speed of grindstones as a cause of bursting, probable the majority of accidents have really been caused by wedging them on the shaft and over wedging to true them. The holes being square, the excessive driving of wedges to true the stone starts cracks in the corners that eventually run out until the centrifugal strain becomes greater than the tenacity of the remaining solid stone, when a leap for liberty is the result. Hence, the necessity of great caution in the use of wedges, as well as the holding of large quick running stones between large flanges and leather washers. For the computation of the centrifugal force of a grindstone, the formula may be the same as for fly wheels, by only inserting the weight of the stone per cubic inch in place of the cast iron, and the radius of the center of gyration in place of the radius of the periphery. For the centrifugal strain tending to break asunder a disk of grindstone, the mean weight of which is 0.078 pound per cubic inch (135 pounds per cubic foot), with a radius of gyration equal to 0.7071 of the radius of the periphery, and using the value of the radius (r) in inches in the formula for strain, as before stated, we have strain $= \frac{W \times V^2}{g \times r} \times 12\,r$, and reduced, $S = \frac{12 \text{ inches} \times W \times V^2}{g}$. By substituting for W the weight of a cubic inch of grindstone (0.078) and for V^2 the square of the velocity of the circle of gyration in feet per second, we have $\frac{12 \text{ inches} \times 0.078 \times V^2}{32{,}166}$ and by reducing, $S = 0.029\ V^2$. By simplifying the terms as in the formula for fly wheels, and by substituting the value of D in terms of the circle of gyration, which is 0.7071 D, we derive from the above expression $\frac{(D\ 3.1416\ N)^2}{60 \text{ seconds}} \times 0.029$ and by further reduction $(0.7071\ D \times N)^2 \times 0.0000795$ = the stress per square inch of section of the stone.

For example, a grindstone 4 feet in diameter, making 200 revolutions per minute, 4 feet $\times$ 0.7071 = 2.8284 feet diameter of the circle of gyration. Then 2.8284 $\times$ 200 = 585.68, and 585.68^2 = 343021 $\times$ 0.0000795 = 27.27 or say 27½ pounds per square inch strain to pull the stone apart. As the sand stone has a tensile strength of from 250 to 350 pounds per square inch, the factor of safety is an average of about ten. This is too small for sandstones that vary in tensile strength from 175 to 225 pounds per square inch. Such a stone should not be trusted at more 160 revolutions per minute for 4 feet in diameter or 2000 feet peripheral velocity per minute. With this formula we tabulate the speed and strain per square inch of area of cross section; the variation in thickness not materially affecting the result, as every inch in width bears its own strain. The Ohio stones are somewhat denser than the figure above given, weighing about 0.081 pound per cubic inch, while the Haron stone is still more dense, 0.089 pound per cubic inch but both have a greater tensile strength in proportion to their density. The Ohio stone will bear a speed of 2500 to 3000 feet per minute, which latter should never be exceeded. The Huron stone is still stronger and can be trusted up to 4000 feet peripheral velocity when properly clamped between flanges and not excessively wedged in setting.

STRAINS IN GRINDSTONES.

Limit of Velocity in Revolutions per Minute and Approximate Actual Strain per Square Inch of Sectional Area for Grindstones of Medium Tensile Strength for the Sizes in First Column.

Diameter.	Revolutions per minute.						
	100	150	200	250	300	350	400
Feet	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
2	1.58	3.57	6.35	9.93	14 30	18.36	25.42
2½	2.47	5.57	9.88	15.49	22.29	28.64	39.75
3	3.57	8.04	14.28	22 34	32.16	.....	.....
3½	4.86	10.93	19.44	30.38	.....	.....	.....
4	6.35	14.30	27.37	.....	.....	.....	.....
4½	8.04	18.08	32.16	Approximate breaking strain ten times the strain for size opposite the bottom figure in each column.			
5	9.93	22.34	.....				
6	14.30	32.17	.....				
7	19.44	.....	.....				

The figures at the bottom of columns designate the limit of velocity (in revolutions per minute), at the head of the columns for stones of the diameter in the first column opposite the designating figure.

A general rule of safety for any size grindstone that has a compact and strong grain is to limit the peripheral velocity to 47 feet per second.

Emery Wheels.

The emery wheel is eminently a speed wheel for grinding; its ultimate tensile strength may be given at 1000 pounds per square inch, although the wheels of different makers and for different purposes vary considerably above and below this figure. The different degrees of hardness of the wheels of any maker will also vary the tensile strength and weight. The lightest wheels are about 0.087 pound to a cubic inch, the heavy ones a little over $\frac{1}{10}$ pound per cubic inch. The light wheels give less contrifugal force, therefore, the use of $\frac{1}{10}$ pound in the formula is a safe figure, and using 1000 pounds as the breaking strength we have computed the table of strains on the basis of a safe factor of about eight at maximum speed for

STRAINS IN EMERY WHEELS.

Diameter. Inches.	*Actual Strain Per Square Inch of Section in Emery Wheels at the Velocities at Head of Columns for Sizes in First Column.* Revolutions per minute.												
	600	800	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000
4	.....	.....	.....	.....	.....	.....	.....	22.67	27.43	32.64	38.31	44.43	51.12
6	.....	.....	.....	.....	.....	.....	.....	51.13	61.86	73.62	86.40	100.21	115.03
8	.....	.....	22.67	32.65	44.45	58.05	73.47	90.71	109.76	130.62	153.30	177.80	.....
10	.....	.....	35.47	51.08	69.51	90.81	114.94	141.90	171.71	.....	.....	.....	.....
12	18.40	32.72	51.12	73.62	100.21	130.88	165.65	.....	.....	.....	.....	.....	.....
14	24.80	43.90	68.70	99.21	134.65	175 60	.....	.....	.....	.....	.....	.....	.....
16	32.57	57.65	90.24	130.31	177.80	.....	.....	.....	.....	.....	.....	.....	.....
18	41.41	73.62	115.03	165.65	.....	.....	.....	.....	.....	.....	.....	.....	.....
20	50.98	90.23	141.22	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
22	61.81	109.41	171.23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
24	73.62	130 88	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
26	86.36	152.85	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
30	115.04	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
36	165.64	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

best wheels. Using the same formula as for grindstones and substituting the weight of the emery wheel, 0.1 pound per cubic inch, we have from the fundamental formula the value $\frac{12 \text{ inches} \times 0.1 \times V^2}{32{,}166}$ and by reducing as before $S = 0.0373\ V^2$. Again substituting the equivalent terms, as in the previous formula, we have $\left(\frac{D\ 3.1416\ N}{60 \text{ seconds}}\right)^2 \times 0.0373$, and again reducing and interpolating the ratio of the circle of gyration (0.7071), we have $(0.7071\ D \times N)^2 \times 0\ 00010226$ = the stress per square inch of a section of an emery wheel.

With this formula we have computed the stress per square inch for emery wheels of commercial sizes, terminating at the maximum speed with a factor of safety of about one-eighth of the breaking strain for wheels of over 1000 pounds tensile strength.

There is a large variation in the listed speeds of emery wheels by different makers—4000 as a minimum and 5600 maximum feet per minute, while others claim a maximum speed of 10,000 feet per minute as the safe speed of their best emery wheels. Rim wheels and iron center wheels are specialties that require the makers' guarantee and assignment of speed.

For some time past a nail rate war has been in progress covering shipments from the Pittsburgh territory to points in Texas. Before the fight commenced the rate was 84 cents per 100 pounds, but it has been brought down to 36½ cents per 100 pounds. Considering the distance covered, which is about 1500 miles, the rate is certainly a very cheap one.

The English Navy.

The condition of the English navy has been recently described in the official statement of the First Lord of the Admiralty, who occupies a position analogous to that occupied by our Secretary of the Navy. The First Lord reports as follows concerning the state of the English navy at the beginning of the present year:

Breech-loading guns afloat and in reserve.	1,868
Light rapid-fire guns afloat and in reserve	1,715
Torpedoes afloat and in reserve	2,874
Fighting ships, in commission, at home, excluding coast-defense ships, gunboats and torpedo boats	21
Displacement tonnage	154,500
Fighting ships, abroad, total, all classes	110
Displacement tonnage	307,000
Complements abroad	23,350
Ships in reserve, ready for commission, excluding coast-reserve ships, gunboats, &c	19
Displacement tonnage	82,200
Ships of 15 knots speed and upward, afloat and building, all classes except torpedo boats	140
Establishment of officers and men, active list	74,100
Royal naval reserve	23,500

Similar data concerning the condition of the navy of the United States at the beginning of the present year may be roughly stated to be somewhat as follows:

Breech-loading guns afloat	120
Rapid-fire guns afloat	100
Torpedoes afloat and in reserve.	None.
Fighting ships, in commission, at home and abroad	15
Displacement tonnage	48,400
Complements	5,500
Ships in reserve (12 monitors and 16 wooden ships)	28
Displacement	45,000
Ships of 15 knots speed and over	12
Establishment of officers and men	9,000

In giving the above figures of the United States only such ships as are modern and already in service are counted.

Now, there are some other figures that we can place before our readers which may be of interest to them, especially if it be conceded that in the event of any rupture between Great Britain and another country the magnificent commerce of the former will be sure to suffer. It is this commerce and its relation to the naval services of the two countries that we herewith append. All the naval strength of each nation is counted, both the ships built and those in process of construction:

Particulars.	Great Britain.	United States.
Number of merchant steamers (above 100 tons)	6,595	460
Gross tonnage of ditto	8,653,343	587,442
Approximate value of merchant navy	$560,000,000	$46,000,000
Annual imports, approximate, food	$800,000,000	$250,000,000
Annual imports, approximate, total	$2,200,000,000	$800,000,000
Annual exports, approximate, total	$1,600,000,000	$780,000,000
Total exports and imports	$3,800,000,000	$1,580,000,000
Number of ironclad ships	66	6
Number of cruisers and sloops (above 900 tons)	166	47
Number of war vessels of 14 knots and over	168	31
Number of merchant steamers to each cruiser	40	11
Amount of steam tonnage to each cruiser	52,100	14,300
Number of merchant steamers to each war vessel capable of steaming upward of 14 knots	39	15

While the above figures may not be absolutely exact they are relatively so.

A new apparatus, for use in case of shipwreck, is a kite, controlled with bridles, invented by Professor Woodbridge Davis. It is 7 feet long, and is made of oiled silk. The wind which would be driving the vessel shoreward would be available for the propulsion of the kite, and communication with the shore could be thus established.

How to Fire a Boiler.

The following paper was read by Richard Hammond of Buffalo before the recent convention of the National Electric Light Association:

It has been said that "the waste of fuel due to improper firing is often of more consequence than any other loss which is produced in the operation of a steam plant," but in a great many cases the waste of fuel cannot be entirely charged to improper firing, as there are other causes by which a waste of the evaporating power of the fuel is produced. The principal of these are the following:

The improper construction of the boiler in relation to grate surface, tube area, heating surface and combustion chambers. Unless these proportions are properly worked out it matters little whether the firing be done by mechanical means or by the more intelligent fireman; waste of fuel must necessarily follow. A great many contrivances have been placed on the market, such as mechanical stokers and other means, by which coal and air can be supplied to the furnaces of steam boilers for the purpose of obtaining good combustion without producing a waste of heat by allowing too much air to pass above the grates, or an insufficient supply below the grates. By this statement I do not mean that any particular method of firing will produce any more heat from a pound of coal than nature put into it. Just as good results can be obtained from hand firing as have been obtained by the best mechanical means.

It is often the case that firemen are paid insufficient wages for the work they are expected to do. We should be as particular to have good firemen in charge of our boilers as we are in having good engineers in charge of our engines. A good fireman should be capable of manipulating the furnaces of his boiler so that his steam recorder and his coal and water records will show just as good cards as the engineer can show in the manipulation of the steam he uses in his engine. If we paid the same attention to all the details of the construction and setting of our boilers and their economical use of fuel as we do to our engines our steam plants would be far more economical. Everything is "shined up" about the engine; engineers go into all the details of its construction and management, and the greatest care is taken in the figuring out of its proportions so that it will have the very highest possible initial steam pressure and temperature and the very lowest possible terminal temperature and pressure, all endeavoring to get the greatest horse-power from the pound of coal, thus securing the greatest economy. These very same highly educated individuals, who designed these engines, forget that all the power comes from the pound of coal, and pay little attention to how that power is transmitted from the coal pile to the engine. It is just as essential to good economy that the boilers should have the very highest initial or furnace temperature, and the highest possible steam pressure, and the lowest possible chimney temperature, as it is for the engine to be economical under similar conditions of high initial pressure and temperature and low terminal temperature.

Experiment has proved that bituminous coal requires 150 cubic feet of air per pound of coal for good combustion. An excess of air results in a waste of heat, which it carries into the flues and chimney, and often a greater loss in an insufficient supply to produce good combustion.

In my experience, for steam plant boilers carrying 80 to 160 pounds of steam, I find that at least 20 pounds of bituminous coal should be burned per square foot of grate per hour, and the air spaces of the grates should not be less than 50 per cent. of the grate area, and the draft pressure not less than 2½ inches of water. If the grate surface is so large that only 10 pounds of coal are consumed, it would be more economical to reduce the grate surface and burn not less than 20 pounds with good draft, thus securing a good combustion. The same weight of coal burned on a large grate would not be as economical on account of the low temperatures. The temperature of the furnaces should not be less than 3500°, and the ratio of the draft area through the tubes or flues should not be less than one-sixth nor more than one-fourth of the grate surface, and the proportion of heat surface to grate surface should be at least as 35 to 1.

Under the conditions just stated boilers should be fired very economically, whether done by mechanical means or by hand. I have noticed in firing marine boilers on the great lakes that the firemen spread their coal evenly over the entire grate at each firing, and they produce steam very economically, while firemen on coastwise steamers will pile up the coal just inside the furnace door, and as it becomes coked will rake it back over the incandescent fire and grate with equally as good but no better results in the way of economy than obtained by the lake firemen. Both of these ways of firing are equally good, but in all cases the grate bars should be entirely covered, and the amount of air required above the grate should be admitted from above instead of below the grate.

Different grades of bituminous coal require different methods of firing, and by a little experiment the experienced fireman soon finds out and adopts the best method of firing, and in all cases he should keep his flues and tubes clear of ashes and soot, as well as his fires and grate bars. In firing anthracite coal, the coal must be spread evenly over the grate in all cases, and like bituminous coal must be burned at a high temperature with good draft.

The steam users should see to it that all parts of their boilers and settings are of equally as good proportions for strength and economy as their engines, employ good, intelligent firemen as well as engineers, and see that both produce good indicator cards By a little attention in this direction steam users will themselves soon become experienced firemen and engineers, and can readily tell whether the firemen and engineers are doing their duty.

The new article known as cellulose, heretofore fully described in these columns, will be applied to five of the ships at present under construction for the navy. These ships are the two battle ships Massachusetts and Oregon, the New York, and cruisers Nos. 12 and 13, the triple-screw ships, all of which vessels are building at the Cramp shipyards in Philadelphia, in which city also are situated the works for the production of cellulose. Coffer dams will be built on the inside of the steel hulls and filled with the material. The idea is to protect the vitals of a ship from the inflow of water which would follow the entrance of a projectile, and in some of the ships the coffer dam will run only behind what is known as the belt. It is estimated that it will take $1000 to equip a vessel with the protective quality.

Canadian seamen, according to a dictum of the Treasury Department at Washington, can no longer be employed on lake vessels carrying the United States flag. In the absence of any discrimination the provisions of the contract labor law as applicable to seamen were practically a nullity.

Continuous Wire-Drawing Machines.

A description of the wire-drawing machines built by the Waterbury Machine Company, Waterbury, Conn., will be of interest to manufacturers of copper, brass and steel wire, or rather of special interest to those manufacturers who are drawing, in large quantity, wire smaller in size than No. 12 gauge. The company own the patents of James E. Burnes; they have improved the original Burnes machine, and now claim to have the most successful machine that has been devised for drawing fine wire, from No. 20 down to the finest sizes possible to be drawn.

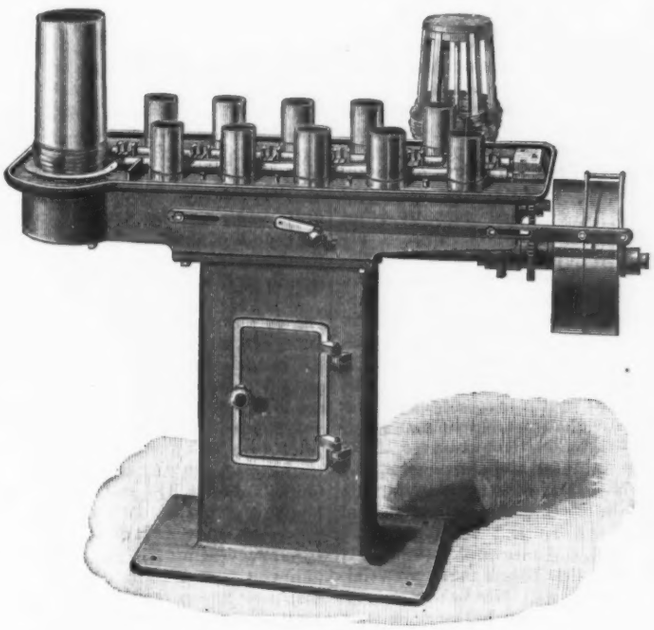


Fig. 1.—Small Machine.

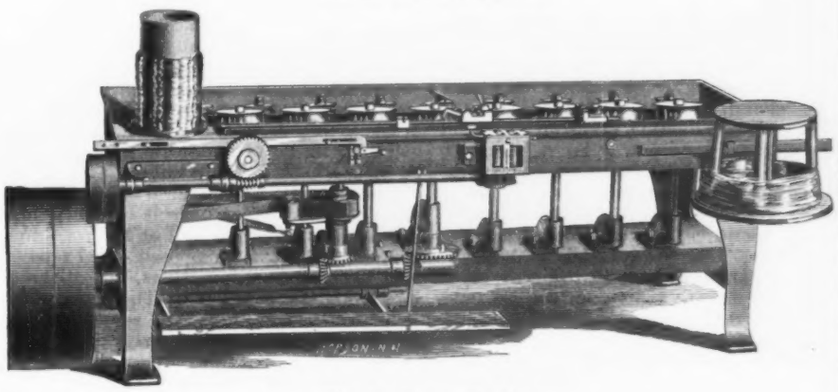


Fig. 2.—Large Machine.

CONTINUOUS WIRE-DRAWING MACHINES.

A pedestal is surmounted by a frame work which carries the several drawing blocks, Fig. 1, and along the upper surface between the three rows of blocks, 3 inches in diameter, will be seen the lubricating rollers. At the point where the wear comes the blocks are provided with removable rings of hardened steel or of chilled iron, and can be easily renewed; they are all driven at the same speed by a suitable train of cut gears. The finishing block is 7 inches in diameter—sometimes 8 inches—and is driven at the same surface speed as the small blocks. Power is applied to the pulleys shown at the end of machine, and controlled by a crank belt shifter, which locks the belt on either pulley. The lubricating device consists of two light cylinders, which are gear-driven, and they extend the entire length of the trough which contains the lubricant; their lower surface dips into the liquid, and as they revolve, brings up a surface coating, keeping the die holders, which are between the rolls, full to overflowing at all times. The die holders are placed in a single row, central with the machine, and when the dies are dropped into the receiving pockets the diamonds are submerged and are safe from fracture by heating, and are thoroughly lubricated. At the back of the machine is placed the usual reel holder, which is adjustable in position along the frame.

To operate this machine becomes a very simple matter, owing to the convenient arrangement of all the parts. The end of the wire as it comes from the reel is pointed by filing on the large sizes, or by stretching on the finer sizes, and its reduced end threaded through the largest die in the series (the one to the extreme left in Fig. 1). The die is then laid in the proper holder and the end of wire wound one and one-half times around the block which is in front of the die holder; it is then passed through another die and around a second block on the opposite side of the machine, and so on in a zigzag course until it reaches the finishing block, where its end is fastened so that this block pulls positively.

Its action here is precisely as on the well-known wire block. Now, while all of the small blocks pull by friction alone, each does work enough to reduce the wire one gauge, but as the pulling capacity depends on how tightly the wire hugs the blocks, and this in turn depends on the pull of the finishing block, it will be seen that the latter controls the speed of the wire through every die. The several small blocks run faster than the wire at every point, but they cannot pull more wire than they deliver, as they would then release the friction due to the tension, and cease to pull. This is by no means a delicate matter, and regulates itself to perfection.

To supply the demand for a continuous drawing machine for drawing wire from No. 12 or No. 14 down to No. 20 or No. 22, the Waterbury Machine Company designed the large machine, Fig. 2, and have recently forwarded application for patent on the combination of its features.

The drawing rolls of this machine are 6 inches in diameter, and, like those on the small machine, are provided with removable wearing rings. All the drawing rolls are placed along the front of the machine, the rolls at the back being simply guide rolls, and not driven. The drawing rolls are driven from a central vertical shaft, which receives its motion from the horizontal driving shaft and pulleys. The train of cut gearing which connects these several rolls is so proportioned that the second block from the right hand runs 20 per cent. faster than the first, the third block 20 per cent. faster than the second, and so on to the last block. A certain amount of slip is necessary in this system of frictional driving, and as the exact elongation from size to size varies, say, from 22 to 40 per cent., and the rolls are speeded so that there is never less than 2 per cent. nor more than 20 per cent., this method has proven quite as efficient as where separate adjustable frictional devices are arranged for driving each block, the nice adjustment of which consumes time and gains naught. The finishing block, however, is arranged so that the speed may be varied in relation to the last roll of the series, as it is sometimes desired to make the last die act merely as a smoothing or sizing die, and not to materially reduce the wire. By a simple operation its speed may be regulated so as to run at the same speed as the block or roll preceding it, or it may be given any other speed up to 20 per cent. faster.

One of the important differences between this and the small machine is in the method of lubricating. No devices or mechanisms are required. There is simply a wide tank or trough, in which are arranged the several die holders and the series of guide pulleys. The several shafts which carry the drawing rolls are not vertical, but their upper ends are all inclined several degrees toward the back of the machine, so that the wire, when passing from one of the rolls to its turning pulley, which is placed at the back of the trough, enters the lubricant at an angle with its surface and passes through a submerged die, then around a guide pulley, and emerges from the liquid at the same angle it entered, thus properly leading on to the next drawing roll.

The method of threading up this machine is similar to that described for the small machine, the principal difference being that only the front rolls in this are driven; and it is only around these driven rolls that the wire is wrapped to get the necessary pulling tension. Since larger sizes of wire are operated on by this machine, a special attachment is added for reducing the ends, also a complete drawing-in mechanism for the larger sizes, which require more strain than can be readily applied with hand pliers in pulling a sufficient quantity of wire through the dies for threading up. Through the last few smaller sizes there is no difficulty in drawing the wire with pliers.

The reducing and drawing-in mechanisms are arranged to be driven independ-

ently from the machine proper and can be stopped and started as required. Both steel and diamond dies may be used in these machines.

The continuous drawing machines are in successful use, they are well built, and in actual operation have been found to require but little attention.

The Cost of Aluminum.

In a lecture before the Franklin Institute of Philadelphia, A. E. Hunt of Pittsburgh, president of the Pittsburgh Reduction Company, has dealt in an interesting manner on aluminum, its manufacture and uses from an engineering standpoint. We quote as follows his views on the cost of manufacture·

In the economical reduction of the ores of most metals, one of the most difficult problems to be solved has been the wastage due to oxidation, volatilization or the solvent action of slags, or the impartial reduction or separation and collection of the metal, and its consequent waste in the scoria or refuse product. There are very few metals reduced to their pure state without a wastage of at least 10 per cent. In the manufacture of aluminum as practised by the Pittburgh Reductiom Company, there is practically no waste whatever, the waste problem having been by the Hall process entirely solved.

I have already, in a previous lecture in February, 1891, before the Boston Society of Arts, stated that the cost of manufacture under the most favorable conditions with water power and large output would be approximately 20 cents per pound. Nearly one year's experience and careful study of the matter leads me to reiterate the statement then made, and to prophesy that the ingot metal will be made by the Hall process within the next few years at a cost of between 18 and 20 cents per pound; the items of cost being about one-third for the ore, one-sixth for the expenditure of other materials than ore, one-third for the electrical current expended, one-twelfth for labor and superintendence, and one-twelfth for general expenses, interest and repairs.

Analyzing these items of cost, the ore will probably be the greatest item of expense in anv successful process, and surely the oxide alumina is not only the richest and most easily prepared pure ore, but will prove one of the cheapest, if not the cheapest, of compounds from which to extract the metal. Any methods of cheaper production of alumina from clay or other more abundantly found mineral than bauxite (the hydrated oxide, containing from 55 per cent. to 60 per cent. alumina, and with less than 10 per cent. silica and iron, the remainder being water), which can be laid down in Pittsburgh now in almost unlimited quantities at less than ½ cent per pound, will be equally applicable to the electrolytic as to any other process. Quite surely no difference here in the art will make an insur mountable barrier of cost for the electrolytic processes now in use to compete against. The expenditure for other reagents than the ore, for carbon and for chemicals, is now less than 5 cents per pound, with the Pittsburgh Reduction Company, and in the estimate can fairly be reduced to 3 cents per pound for a large plant, with most favorable arrangements made for its supplies. In the item of electrical power, there certainly may be room for curtailment of cost; but even should this expenditure of electrical power be lessened one-half, or entirely done away with, heat alone being substituted as the energy for reduction of the ore, it will be difficult to conceive of a method that would not require a cost of at least 1 cent for this heat, which would be a saving perhaps of 4 cents per pound upon this item of electrical power. However, I feel confident that should such processes be devised, the increased expenditure for chemicals and other reagents, besides the amount quoted as necessary for the Hall electrolytic process, will nearly, if not quite, counterbalance the saving in electrical energy expended in the Hall process.

In the items of labor, superintendence and general expense, interest and repairs, there may be a small saving made by a process yielding metal more rapidly than by the comparatively slow electrolytic process.

I would, however, here call attention to the fact that our present experience leads me to believe that the items of labor and superintendence will quite surely be reduced to between 2 and 3 cents per pound of metal produced, and the amount required for general expenditure, interest and repairs to no larger than an equal expenditure, when the metal is made upon a very large scale. Again, these are necessary and inherent items of cost of any method of manufacture and the amounts that can be saved here by other possible means of manufacture, in my judgment, will prove very small indeed, surely not more than three cents per pound at greatest—an amount which I grant might, at some future time of competition, be a fatal one to the higher cost parties, but would not be such an amount as to lead to such startling changes in the selling prices of the metal, beyond what can be done by the electrolytic manufacturing interests, as one would be led to believe by the prophets who have gone before me. With the cost of manufacture being the ore at 6 cents per pound of metal made, and subject to almost any possible lowering of rate applicable to any other process, the power and materials used at 8 cents, and the labor and all remaining expenses at between 4 and 6 cents per pound—cost items that I believe will be obtained gradually within the next few years by the electrolytic methods of production, I do not believe that there will be other methods devised to successfully compete with their totals of cost per pound. The average energy expended per pound of metal produced by the Pittsburgh Reduction Company is about 20 electric horse power hours, or each electric horse-power hour of energy exerted upon the electrolyte yielding about $22\frac{7}{10}$ grams of metal. Each month, by new experience, we are adding to this efficiency, and we confidently hope to make a gain of at least 10 per cent. upon this record soon; and I shall not be satisfied until this gain in efficiency shall reach at least 25 per cent. over present rates.

Our compound engines have a record of 2 pounds of coal per indicated horse-power hour, and with a 20 per cent. loss of potential in conversion of indicated horse-power into electrical—an estimate that is very liberal—we have 24 indicated horse power hours per pound of aluminum produced, or an expenditure of 48 pounds of coal, which costs us 80 cents per ton at our works, or an expenditure for fuel of less than 2 cents per pound for the aluminum produced. Of course, to this has to be added labor, water (which we pump direct from the adjacent Allegheny River) and repairs; items which count up considerably upon a plant of only 600 horse-power; but with a large plant will bring the cost for power per pound of aluminum very low, and at a rate which will compare, especially if triple expansion and condensing engines are mude use of, very nearly equally with the cost of the best water powers. With water powers, of which there are several in blocks of over 1000 horse-power each, throughout the country, available at rates of from $8 to $15 per horse-power per annum, we can reckon on the cost of the electrical energy per pound of aluminum at between 2¾ and 3 cents per pound of metal made. Undoubtedly, the splendid power to be developed at Niagara will prove one of the best in the world for the manufacture of aluminum.

At these rates, a margin of nearly 100 per cent. is allowed in the estimate given above for the cost of the electric power for a plant manufacturing aluminum by the Hall process under the most favorable conditions.

The Tacony Iron and Metal Works.

The Tacony Iron and Metal Works, Tacony, Philadelphia, are making rapid progress in their contract for manufacturing and plating the iron upper structure and dome and casting the bronze statuary and ornaments for the great tower of the Philadelphia public buildings. The lower portion of the iron work summit is already fixed and in place, and the skeleton iron frame work of the dome has been erected at the Tacony establishment. Both are only awaiting the cast-iron plates which will clothe them after having received their aluminum plating, as described last month in *The Iron Age*.

It is expected that the first of the massive columns, 26 feet high and weighing 9000 pounds each, of which there will be 32 round the base of the dome—will be passed through the electro-plating process in the new shop in a week or ten days, and the result will be awaited with great interest as being the first attempt hitherto made to produce so large a piece of plated metal. James D. Darling, under whose management the preliminaries are being prepared, speaks very confidently of assured success for the experiment; and it is believed that as soon as the electro-plating machines are in regular working order the various portions of the structure which are to receive the aluminum coating, and comprising a total surface of 100,000 square feet, will be carried through the baths in rapid succession, the major part of the work being now ready to undergo the process. The plates intended to cover the lower section of the iron head of the tower will be attached to the fixed frame work as fast as they are coated. The aluminum plating will be of a uniform thickness of $\frac{1}{16}$ inch.

The gigantic statue of William Penn, weighing 25 tons, which is destined to crown the pile, is also well on the road to completion. It is composed of 47 separate pieces of bronze castings, and all are now ready except the hat. The figure will be 37 feet 4 inches high, and some idea of its immense proportions may be entertained when it is learnt that the hand is 4 feet 6 inches long, and the hat measures no less than 12 feet in circumference.

The lesser groups of statuary—themselves 22 feet in hight—which are to stand at each corner below the dominating figure, together with the four emblematic eagles which fill the intermediate spaces, are all in a more or less advanced stage of progress. The groups represent an Indian and a dog; a Swede; an Indian woman and child, and a hunter.

All the statues are being molded and pieced together in a large shop built especially for the purpose last year, which has a hight of 67 feet and is 280 feet long, and contains two furnaces of 10,000 tons and 5000 tons capacity respectively.

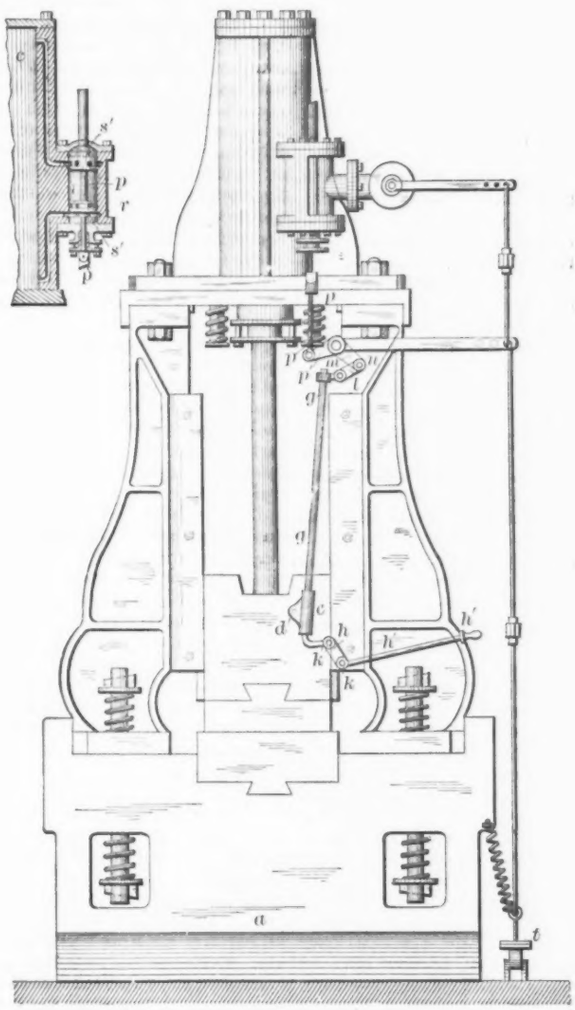
When finished the tower will contain 8000 tons of iron and bronze rising to a hight of 213 feet above the marble shaft, itself 335 feet high. All this metal work is the manufacture of the Tacony establishment.

Besides this work the company are also engaged on the iron castings for the windows, &c., of the Congressional Library at Washington, which are very well for-

ward. Four hundred workmen are busily employed by them in these operations at Tacony, Philadelphia, and Washington; and for the present the two large contracts absorb almost all their energies and resources.

The Trethewey Steam Hammer.

Samuel Trethewey, president of the Trethewey Mfg. Company of Pittsburgh, Pa., has been recently granted a patent on a steam hammer valve gear which embodies some interesting features. The principal object of the design has been to provide an automatic valve mechanism permitting the control of the movement of the ram so that while the stroke



THE TRETHEWEY HAMMER.

of the ram and the rapidity of the stroke may be varied, yet practically the full strength of the blow is obtained. At the same time the valve controlling the supply and exhaust of steam of the cylinders is given its full stroke. Automatic valve mechanisms hitherto designed to vary the length and the rapidity of the stroke were defective in that they were accompanied by a loss of power. With the rapid and short stroke the valve in these designs is not moved for its full stroke, so that the strength of the blow was reduced as the speed increased.

The essential feature of the Trethewey design lies in the following device: Attached to the tup or ram by a pivoted joint, d', is the sliding bearing or sleeve c, which slides on the slide bar g. The latter is mounted on the crank arm h, which is journaled on the stud a, attached to the main frame. It is operated by a hand lever, h', as shown. The slide bar, therefore, is supported by the crank h and by the sliding bearing c. As the crank h is turned the lower end of the slide bar is forced toward or from the tup or ram, so changing its angular inclination or drawing it parallel with the ram, as may be desired. Since, however, the bearing c fits on the slide bar g, the point at which the bearing rests on the slide bar is held at a greater or less incline; the movement of its upper or free end necessary to move the valve is obtained by a less or greater stroke of the ram. Connected to the upper end of the slide bar is a link or strap l, which in its turn is connected to the crank lever m. Its end, pl, is connected with a valve spindle, p, and that in turn holds the valve r, shown in the section at the upper left hand corner of our engraving. This valve controls a part of the steam cylinder, steam being admitted and exhausted through suitable pipes, s and s'.

The normal position of the slide bar b when the hammer is being operated automatically is at an incline to the ram, its position being such that as the bearing c reciprocates on the slide bar the full stroke of the valve spindle is imparted to the valve. As the sliding bearing rises on the slide bar it draws its upper end toward the ram, raising the valve, and as soon as the latter has its full stroke, steam is admitted to the upper end of the cylinder, the ram is reversed and the sliding bearing on the sliding bar, thus imparting the necessary movement to the valve, and giving it its full stroke.

In order to change the stroke of the ram so as to decrease the length of the stroke and increase its rapidity, the pivotical part k' at the lower end of the slide bar is forced down by the lever h' towards the ram, so as to give the slide bar an increased incline. The stroke of the hammer can also be controlled in the ordinary way by the treadle t. The valve movement has been proven in practical use, and has been found effective in action.

WORLD'S FAIR NOTES.

Construction Work.

Workmen began raising trusses last week to support the roof of the Manufactures Building. When erected these trusses will be among the largest in the world. There will be 22; each will cover a span of 388 feet. Over the center of the roof, inside, to the ground floor, will be a distance of 211 feet. Each truss weighs 200 tons, and 6000 tons of steel will be used in the roof of the building.

Monday night work began on the Electricity Building, and a double force is to be employed continuously night and day until the structure is completed. The contractors for the Manufactures Building were also notified to engage more men.

On the Electricity Building 276 men are engaged. All the iron trusses of the transepts are in place and men are putting in the central trusses. Carpenters are placing the gallery and roof joists, laying floors, sheathing the roof and building the towers. The north towers are nearly up to their full hight and all the others are up to the hight of the ridge of the building.

One hundred and ten men are at work on the Administration Building. The iron work of the dome is completed, except several ribs and purlins yet to be put in place. The rough wood work on the main entrances is nearly completed and the staff workers are following the carpenters as closely as possible.

On the Machinery Building 269 men are at work. Carpenters are framing trusses and placing posts for annex; they are also at work on the two pavilions. Seven steel trusses are now in place, connecting rods being placed.

On the Fine Arts Building all the walls are up to the roof line and all the roof girders are in place. Work is progressing on the court walls above the roof. Carpenters are following the masons and iron contractors as rapidly as possible.

In all, over 5000 men have been employed during the week on the various buildings and the grounds.

The Mines Department.

Considerable misapprehension exists, both in this country and abroad, as to the mines and mining exhibit which is to be made at the exposition. At world's fairs heretofore, the mineral and allied exhibits have been shown in the Manufactures Building, or in annexes to other structures occupied by exhibits having but remote relation to anything of the mineral description. Many press notices and comments indicate that the impression prevails widely that such is to be the case at the exposition of 1893. But that is far from being true. "Mines and Mining" has been made a separate and distinct "Department" of the Classification of Exhibits, and will have the exclusive use of one of the finest and largest of the exposition buildings. The Mines and Mining Building measures 350 x 700 feet, and has a total floor space of almost 9 acres, and cost $265,000. The fact is, that at the World's Columbian Exposition, for the first time in the history of such enterprises, the mining industry and products are accorded the recognition which their exceedingly great importance to the wealth and prosperity of all civilized nations really demands.

Mr. Skiff, chief of the department, says that it is already assured that in the Mines and Mining Building will be gathered in 1893 incomparably the largest array and most complete and most instructive evi dence of the mineral wealth and progress of the mining industry ever collected or attempted.

Terraces and Medusaline Walks.

Bids were opened for producing what World's Fair people think will be probably the most striking and beautiful feature of the exposition. This will be the broad terraces, medusaline walks and miles of flowers and shrubbery which are to rise on both sides of the sys em of canals in Jackson Park. The canals run from one end of the park to the other. The main basin, extending from the lake to the Administration Building, is 300 feet wide. The others are 150 feet wide. About these will ply launches. Rising 6 feet from either side from the water's edge will be a retaining wall. At the summit of this wall is to be the first terrace. It will be 60 feet wide. Occupying a space 20 feet wide in the middle will be beautiful flowering plants and shrubs. On either side of this stretch of green are to be medusaline walks, each 20 feet wide. Medusaline is a newly-invented building material which is harder than stone, can be molded into any shape, and is susceptible of polish as smooth and brilliant as granite.

Rising another 6 feet will be a second wall. This is to be covered with staff, giving it the appearance of solid masonry. From its top, extending outward, will be another walk, also of medusaline, 60 feet wide. Along the inner edge a highly ornamental balustrade 2 feet high, with staff-covered posts, will extend the entire length of the terrace. There are to be 16 boat landings along the canals, and broad stairways from 24 to 60 feet wide will lead from the water's edge to the second terrace. The steps will be of medusaline. At intervals of 20 or 30 feet along the balustrade will be arc and incandescent electric lamps.

Largest Fountain in the World.

At the foot of the main basin in Jackson Park will be erected the largest fountain in the world. Sculptor McMonnie of New York is designing it. He has gone to Paris to have the work done, and there are now engaged a force of molders and blacksmiths working night and day to get the big fountain ready.

The idea is that of an apotheosis of modern liberty. Columbia will assume the shape of a triumphal barge, guided by Time and heralded by Fame. There will be eight standing figures, representing on one side the arts and on the other Science, Industry, Agriculture, and Commerce. Eight big sea horses will form a circle directly in front of the fountain. They will be mounted by eight stalwart young men as outriders, who will represent Commerce. The design of the basin is circular, 150 feet in diameter and flanked on each side by columns 50 feet high, surmounted by eagles. The water will be furnished by a half circle of dolphins in the rear and by a system of jets, which will surround the barge and figures. At night the fountain will be illuminated by electricity. The smallest figure will be 12 feet high and the largest 20 feet high. Mr. McMonnie expects to complete his colossal fountain this year.

Electrical Display from England.

A meeting of the Committee on Electrical Display at the Chicago Fair was held in London on the 29th ult., the distinguished expert, William Henry Preece, F.R.S., in the chair. About a dozen other notable electricians were present. Sir Henry Wood, head of the British Commission, was also in attendance. It was developed that there is every prospect that British electrical interests will be adequately represented at the fair. An especially good display of engines and dynamos will be made. It is probable that the rooms devoted to the exhibit will be lighted with electric furnishings of English style, which have proved to be a great attraction at the electrical exhibition now in progress in the Crystal Palace. European firms, however, have deferred making positive arrangements until the arrival of a representative of the fair management, who is expected shortly from Chicago.

A Congressional Investigation.

On Wednesday the Congressional World's Fair Investigating Committee, consisting of A. M. Dockery of Missouri, Chairman and Congressman Barnes Compton of Maryland, C. R. Breckinridge of Arkansas, D. B. Henderson of Iowa and William Cogswell of Massachusetts, arrived in Chicago and began their investigation of the accounts of the exposition management. Their work on Wednesday was limited to receiving printed reports from President Palmer and President Baker in answer to the interrogatories submitted by Mr. Dockery some time ago. President Baker's report estimated that all told it will cost $22,246,403.03 to complete the fair. He showed that up to date there has been expended $3,860,934, while liabilities under contracts, &c., reach $4,692,724. The receipts have been from all sources $6,252,404. The balance due on stock subscriptions and from the city of Chicago was given at $5,713,051.

President Palmer's report estimated that since the organization of the commission up to March 15 there had been expended $184,522. He estimated the needs of the commission up to the close of the fair would require an appropriation of $292,383. For expenses after the close of the fair in winding up business, $75,600, he thought, would be needed. For awards he estimated $700,000, making a total of $1,067,983.

Mrs. Potter Palmer's report for the Board of Lady Managers showed that it had expended since its organization to March 15, $57,811. Mrs. Palmer estimated that the board would need for use to the close of the fair an appropriation of $227,574.

The committee visited Jackson Park on Thursday, escorted by Director-General Davis, President Baker, President T. W. Palmer, Chief of Construction Burnham, Secretary Dickinson, Chief Handy, Commissioner J. W. St. Clair, Commissioner E. B. Martindale and others. While the committeemen desired to refrain from expressing any opinion, they said at the close of the inspection of the buildings that they were on a larger scale than they had anticipated and that splendid progress had been made. They expect to remain in Chicago for at least ten days and will make a very exhaustive inquiry into all expenditures for the information of the House of Representatives, although hostile motives are earnestly disclaimed.

Pittsburgh at the World's Fair.

The Pittsburgh office of the Pennsylvania World's Fair Commission has been advised that it has been decided to begin immediately with the assignment of space on account of the large number of applications for space that are being made. All indications point to the fact that Pittsburgh will be represented in a manner that will do credit to the city and to its vast industries. Nearly all the applicants for space desire to have a working exhibit of their business. Among some of the most important firms who will be represented are the following: Carnegie, Phipps & Co., Limited, and Carnegie Bros. & Co., Limited, will exhibit steel rails and splice bars, and will contrast the old and new methods and products. They will also show structural iron, blooms, billets, &c. They ask for 25,000 feet of space for the joint exhibit. The H. C. Frick Coke Company have applied for space to put in a $10,000 exhibit, consisting of a complete coke plant operating automatically, together with a cross section of the Connellsville coal vein. Every feature of the manufacture of coke will be fully shown. The National Tube Works Company of McKeesport, Pa., ask for 18,000 feet of space. The application states that the company's plant is the largest of the kinds in the world. It is proposed to show in a complete manner how the different kinds of pipes and tubes are manufactured. The W. Dewees Wood Company of McKeesport, Pa., will make a special exhibit of patent planished iron, of which this firm are the exclusive manufacturers in this country. Howe, Brown & Co., Limited, will make an extensive exhibit of steel of various kinds, as will also the Crescent Company. H. K. Porter & Co. and the Pittsburgh Locomotive Works will have an exhibit of locomotives, and will show the contrast and improvements made in the manufacture of locomotives during the last 50 years. The Westinghouse Machine Company have applied for a large amount of space, and will have an attractive exhibit of Westinghouse engines. The Totten & Hogg Iron and Steel Foundry Company and the A. Garrison Foundry Company will have a complete exhibit of rolling mill machinery. The Standard Underground Cable Company will exhibit their products and the conduits used to carry the cables, together with submarine cables. The Pittsburgh Reduction Company, manufacturers of pure aluminum, will have an exhibit showing how aluminum is extracted from the clay. This firm claims to have the only practical process in the world for the manufacture of aluminum, and they will have on exhibition a plant for the manufacture of aluminum. The Union Switch and Signal Company will have an exhibit of interlocking switches, and will show how the railroads of this country are operated as regards safety. The A. French Company will exhibit car and buffer springs. The Keystone Bridge Company will exhibit the modern bridge in all styles, and will contrast with the old method of bridge building, going back to the swinging rope bridge. The United States Glass Company will have a complete exhibit of flint glass, and will show a glass plant in operation. The Macbeth Company will have an exhibit showing how lamp chimneys are made. The Standard Plate Glass Company have applied for space and will show visitors how plate glass is made that is superior to the French article. The Oil Well Supply Company will have one of the most complete exhibits that will be shown, and will spend about $15,000 on it. It will represent the manner in which wells of all kinds are drilled, and will include exhibits of machines of every kind used in the drilling of wells. The Cambria Iron Company of Johnstown, Pa., will have a large exhibit, and will show the difference in methods by which steel is made at the present day as compared with its method of manufacture in earlier days. This firm have possession of a large collection of very old tools and appliances for steel making, and will show how steel was formerly manufactured. The Johnson Company, also of Johnstown, Pa., will show their street railway appliances and electric welding processes. Other concerns have made appliances for space as follows: Beaver Falls Art Tile Company, Beaver Falls, Pa.; Star Encaustic Tile Company, Pittsburgh, Pa.; A. J. Hawes & Sons, Johnstown, Pa., fire brick manufacturers; the Mc-

Conway-Torley Company, Pittsburgh, Pa., railway appliances; tho Singer-Nimick Company, Limited, Pittsburgh, Pa, steel manufacturers; the King Rock Drill Company, hand and steam drills; Schoen Mfg. Company, Pittsburgh, Pa., railroad car appliances; the Tyler Tube and Pipe Company, Washington, Pa., pipes and tubes; Kier Bros. Company, Pittsburgh, Pa., fire brick; H. M. Myers Company, Beaver Falls, Pa., shovels, spades and scoops. Among other concerns that will probably have exhibits but have not as yet applied for space are the following: Westinghouse Electric and Mfg. Company, Pittsburgh, Pa., electrical appliances; Oliver Iron and Steel Company, iron and steel of various kinds; Ford City Plate Glass Company, Ford City, Pa., plate glass; Jones & Laughlins, Limited, iron and steel of all kinds, and Pennsylvania Tube Works, Pittsburgh, Pa, pipes and tubes.

Miscellanea.

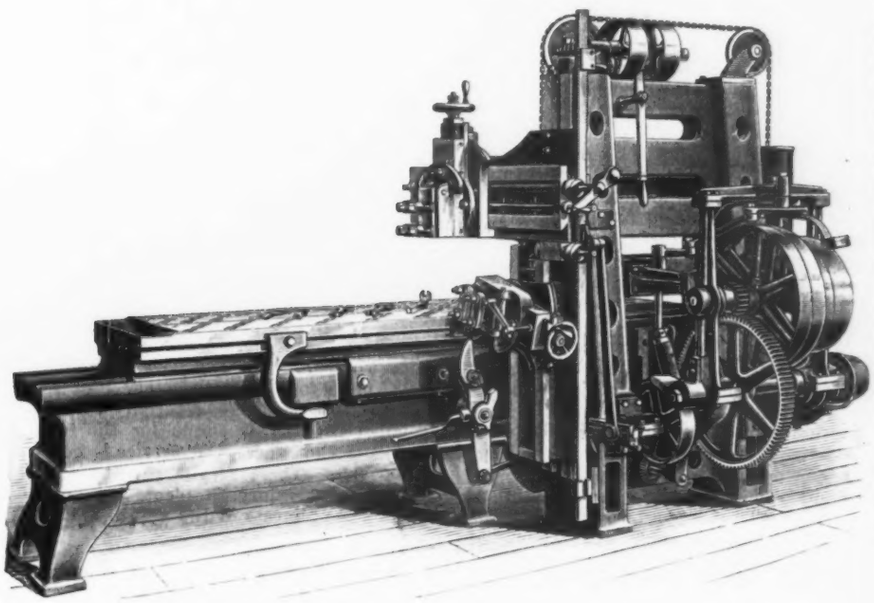
An immense wooden box, bound in iron, was recently found at Helsinfors, in Finland, by workmen engaged in excavating in the cellar of an old house. Upon opening the box the men found that it contained a large parchment and a quantity of pieces of iron of odd shapes. Being unable to make out the contents of the parchment, they carried it to Mr. Rizeff, the nearest magistrate, who found that it was written by Father Suger, one time minister to Louis VII of France. It was an elaborately written treatise upon the use of steam as a motive power, and further examination revealed that the bits of iron were numbered parts of a rudimental but complete steam engine. It is proposed to fit the parts together and to exhibit this pioneer steam engine at the exposition.

The corporation of rifle manufacturers at Liége, Belgium, has addressed a petition to the Government asking for a subsidy to enable it to make a worthy exhibit of its branch of industry at the Chicago Exposition. At Liége about 40,000 persons are employed in the manufacture of arms, but during recent years it is said that the productions of Liége have diminished in prestige. The manufacturers are now trying to re-establish their arms in favor, and to this end want to make a fine exhibit at Chicago.

Idaho will show some splendid specimens of mica in the Mines Building. It has ledges of mica reported to be 8 feet thick and apparently inexhaustible. Sheets of it as large as 10 x 12 inches, without a flaw, and as thin as tissue paper, are not uncommon. It is proposed to have some of the windows in the Idaho Building glazed with mica.

Heavy Open-Side Planer for Working Steel.

The open-side planer, as its name indicates, is a planer constructed with one side open. The ordinary planer is limited in capacity by the rectangular opening in the housing, and it is very apparent that by doing away with one side of this opening the machine is made capable of handling much larger work. As an illustration of what the open-side planer will do, we may state that on a 48 x 36 inch machine a planer post 13½ feet high, 8 feet wide and 3 feet deep has been planed all over.



HEAVY OPEN-SIDE PLANER FOR WORKING STEEL.

Our engraving shows a special heavy open-side planer intended for working steel, which was recently placed on the market by the Detrick & Harvey Machine Company of Baltimore, Md.

To drive these planers the builders use the Sellers spiral planer motion, which, for power, simplicity, durability and smooth running qualities, is familiar to the reader. All these planers are made with the pulley shaft parallel to the bed of the planer.

The cross beam is supported by a brace rigidly bolted to the back of the post. This post is well and heavily proportioned, and is amply strong to overcome any strain. The post takes a bearing on the bed equal in length to one and one-half times the amount of overhang of the beam. The head on the beam has automatic feeds in all directions. The beam and brace are raised and lowered by power. The builders guarantee that there is less vibration at the end of the beam of this machine than there is in the center of the beam of a two-post planer.

The bed has great depth and ample metal, with a length one-half longer than the table. The table is deep and rigid with broad V's, and has planed T slots and cored holes which are designed for use of standard square head machine bolts. These holes are cored through, relieving the platen of chips and facilitating the cleaning of same

The table reverses promptly and without jar, the belt shifters transferring one belt at a time, thus obviating noise made by the belts. The return speed is to the cutting speed as 4 to 1 and 3 to 1, varying with the size of the planer. The reversing lever is so arranged as to allow the table to be run back to examine the work without loosening the dog. The machine illustrated is made unusually powerful, as it is designed for taking heavy cuts and for severe service. The driving shaft is made larger and the main rack wider than in the standard open-side planers of the same size. In addition, the platen, which is very deep and rigid, is gibbed down and enables the side head to be used in taking very heavy cuts without a possibility of lifting the table. The machine is made in two sizes: 36 x 36 inches by any length, and 42 x 42 inches by any length.

Jerome S. Moseley, the machinist in the Industrial Building at Syracuse, N.Y., the patentee of the Eureka scroll saw machine, the Novelty boring machine, &c., has invented a "non-reciprocating high-speed engine," which has attracted considerable attention. The points of superiority which Mr. Moseley claims for his engine are efficiency, simplicity and compactness. An iron base, 12 x 24 inches, seats the engine bearing and shafts. The highest point of the engine from the base is 12 inches. The engine has no cranks or dead points. It has the appearance of a rotary engine, but it possesses features that the ordinary rotary does not have. A soap box will contain the entire machine. Under 40 pounds pressure the engine will develop 5 horse-power, and will be correspondingly strong as the pressure is increased; for instance, 60 pounds pressure will produce 8 horse-power. Aside from nuts and bolts there are only 18 pieces to the engine. Mr. Moseley says that it is not any more liable to get out of order than a reciprocating engine. He also claims that any man of ordinary intelligence is capable of running it. He thinks it will give more power according to the pressure than the reciprocating engine. There is a simple disk revolving inside of an iron case. This disk is supplied with four pistons, one of which is in constant labor at its highest point of efficiency, as though there was one continuous cylinder similar to a reciprocating engine, but with this difference: While a reciprocating engine must necessarily operate on a crank, and hence have two dead points at each revolution, this has no dead points and is ready to start at any point the moment steam is turned on. The engine is so arranged that with a three-way valve it is instantly reversible. Mr. Moseley says that unlike a reciprocating engine when reversed there is absolutely no danger of harm coming to it, however sudden. Mr. Moseley's engine is examined daily by machinists. The inventor says that his engine is admirably adapted for steam yachts. It is so small that it could be easily placed under the floor of the boat. An engine is now being constructed for driving a dynamo, for which it seems admirably adapted. It will need no gearing, being attached directly to the dynamo.

The improvement of the Harlem River entails the building of six large bridges, for which estimates have been made. Including land damages their cost will be nearly $13,000,000, divided as follows: Bridge from Willis to First avenue, $2,000,000; at Third Avenue, $2,250,000; at Fourth avenue, $4,500,000; from 145th street to 149th street, $2,500,000; at Macomb's Dam, $2,000,000, and at King's Bridge, $550,000.

THE SMOKE PROBLEM.

A Report by St. Louis Experts.

About a year ago a general committee was formed to consider the smoke problem in St. Louis and a special committee of experts was appointed to investigate the matter and report. This special committee, consisting of Col. E. D. Meier, Prof. W. B. Potter, R. E. McMath and C. E. Jones, have recently presented a report which is very complete and which covers all points of the smoke prevention problem. A summary of it has appeared in the *Railroad Gazette*.

The approximate quantities of fuel used in St. Louis during 1891 are given as follows:

Illinois bituminous coal.....	2,142,126 tons.
Pittsburgh bituminous coal...	56,000 "
Gashouse coke.....	36,000 "
Other coke (total received)....	165,000 "
Anthracite coal.....	60,000 "
Gas.....	50,000,000 cu. ft.
Oil.....	No figures.

The working seams of Illinois coal reach within about 8 miles of the city. Its heating power is usually about 10,000 heat units by calorimeter test. The best Illinois coal has a heating power of about 12,000 heat units. [The ordinary uses and peculiarities of these various fuels are then described in detail.] Pittsburgh coke costs about $5 25 per ton, while the price charged for gashouse coke is $5 per ton at the works.

The Smoke Producers.

The report discusses as smoke producers domestic fires, industrial furnaces, locomotives and boiler plants. For domestic uses, the prevention of smoke requires the use of smokeless fuels, such as anthracite coal, coke and gas, and it is shown that such fuels can be substituted for bituminous coal without greatly increased cost. Industrial furnaces, including metallurgical and similar work, are not serious smoke makers. Locomotives are said to be a prominent class of offenders, and the use of coke is suggested as a remedy.

For boiler furnaces, which are the most important class, no assistance can be expected from the substitution of smokeless fuels. Illinois coal costs $1.25 per ton, and the use of anthracite would double the cost of steam production The uselessness of attempting to convert bituminous coal into gas and distribute it to boiler plants is then shown. The average quality of fuel gas made from a trial run of several carloads of Illinois coal, in a well-designed fuel gas plant, showed a calorific value of 243,391 heat units per 1000 feet. This is equivalent to 5052.8 heat units per pound of coal, whereas by direct calorimeter test an average sample of the coal gave 11,172.6 heat units. One pound of the coal showed a theoretical evaporation of 11.56 pounds water, while the gas from 1 pound showed a theoretical evaporation of 5.23 pounds. Forty-eight and seventeen-hundredths pounds of coal were required to furnish 1000 cubic feet of the gas. Taking the efficiency of coal used direct as 50 per cent., and that of gas at 90 per cent., and the cost of coal at 6 cents per bushel, and gas at 8 cents per 1000 cubic feet (which is about the cost of manufacture and distribution upon a large scale), we have as the cost of evaporating 1000 pounds of water by coal direct 13 cents, and the cost of converting this coal into gas and evaporating 1000 pounds of water 35.2 cents. It is shown that Lima oil at present prices, and with an efficiency of 80 per cent. of the cost per 1000 pounds of water, would be 17.54 cents.

It is evident, therefore, that the only fuel likely to be used to any extent for boiler work in and about St. Louis is bituminous coal, and that of a quality highly conducive to the production of abundant smoke. In the vast majority of boiler plants in the city the boilers are taxed, at least for an important part of the time, much beyond their capacity when considering the limited amount of coal required for a good smoke record. To supply the additional power, excessive amounts of coal must be burned, and under ordinary conditions dense clouds of smoke are sure to result. Also in manufacturing establishments the demands for power are very variable, and jumps of 100 per cent. within an hour in the demand for steam have been found by tests, varying from a little under the normal work of the boiler to 80 per cent. above it. It is frequently impracticable to meet these requirements by an increase in the boiler plant on account of the lack of space and the heavy expenditures which would be necessary.

A circular letter to boiler users developed the fact that various kinds of smoke preventers had been used, but have generally been abandoned. It was difficult to get satisfactory replies, as many steam users go on from year to year without even an approximate idea of the amount of work their boiler plants are doing. It appears that less than 45 out of 100 of the steam plants in St. Louis could make use of the general run of "smoke consumers" without risk of shutting down. [The report then takes up the requirements for a successful smoke-preventing device.] Of the almost countless number of devices proposed many have decided merits, and are capable of successful operation when the conditions are favorable. The severe test, and which few are able to pass, is that of capacity. With a fuel consumption up to 18 to 20 pounds of coal per square foot of grate per hour, the better devices are able to show a good smoke record, but fail when the consumption is pushed beyond these limits. The importance of this capacity will be appreciated when it is understood that in the majority of the boiler plants of the city these limits of fuel consumption are greatly exceeded during an important part, if not the whole time, of their operation. It is not uncommon to find boilers forced to the extent of 30 pounds per square foot of grate per hour. Finally, it may be stated without fear of successful contradiction that not one of the devices so far brought forward is capable in its present form and application of fully meeting and satisfying all the requirements specified above.

Steam Jets.

These consist of steam injectors to force air into the fire place either directly from the outside or after being heated. They have been applied in many ways and have been called by many names. The action is essentially the same in each, whether the nozzles are placed in front above the fire doors, in the side walls of the fire place, or in the bridge wall. It is to supply air in sufficient quantity above the fuel bed for the combustion of all combustible materials, and to effect such a thorough mingling of the air, gases and carbon that combustion will take place more readily, and hence not far beyond the fire place. Where the heat is sufficient more or less water gas is formed by the decomposition of the steam into hydrogen and oxygen, the latter in a nascent state being more effective in oxidizing the separated carbon, and the former readily burning back to water by combination with the oxygen of the air blown in.

These jets can be made to work satisfactorily where the demand upon the boiler is comparatively light and does not vary much, but it is necessary to supplement their action with careful and regular firing. If too much coal is charged in the fire place at a time, the temperature is likely to be so much reduced that the action of the jets tends to retard rather than to promote combustion. With variation in the demands upon the boiler, the jets require corresponding adjustment to secure favorable results. Such a system is, therefore, largely dependent for its successful operation upon the skill and faithfulness of the fireman. In most instances the capacity of the jet blowers is too small for the amount of work the boilers are called upon to do, and where the capacity is sufficient it often happens that, with the careless handling usually practiced, the amount of steam used in the jets more than offsets any gain in efficiency due to improved combustion. Another very important consideration is the setting and adjustment of the nozzles, which, if not very carefully attended to, may be the cause of a blow-pipe action upon the boiler shell or grate bars, resulting in a rapid burning of the metal, especially from the strong oxidizing action of the decomposing steam. Several instances of this kind have occurred in this city.

It will be evident, therefore, that the steam jet blower system, as usually applied and operated, is far from satisfying the requirements specified for a successful device. The determination of capacity and the adjustment in setting cannot safely be left to the boiler maker or boiler setter, nor to the engineer of the establishment, who is frequently only an engine tender. Nor can the operating of the device be left to the average fireman. On the other hand, it may be said that the requisite engineering skill and experience can always be obtained, if sought for, to secure a safe and suitable application of the system.

The necessary qualities to make a reliable fireman can also be had if those interested would appreciate the importance and advantage of demanding these and of offering suitable compensation for faithful and efficient services. Under such conditions the steam jet system can undoubtedly be made to yield satisfactory results in controlling the smoke, especially where the boiler capacity is ample for the requirements and where the service is not too variable. These results can be attained without injury to plant, but not without some increase in the cost of operating.

Fire-Brick Arches or Checker Work.

These have been applied in many ways, and the resulting devices are known by many names. They are usually placed near the rear end of the fire place or over the bridge wall. Their action is of a twofold character: First, to cause a more thorough mingling of the smoke and gases with air admitted above the fire bed, and, second, to increase the heat of this mixture. The conditions favoring complete combustion, not only of the gases, but of the more difficultly combustible separated carbon at the same time, are thus brought about.

The arch causes the smoke, gases and air to pass through a constricted passage close to the fuel beds, which should be kept in the glowing coke stage. The arch itself serves not only to reflect the heat from the fuel bed, but as a storage accumulator of heat which tends to regulate the heat and keep it up to a more uniformly high temperature. The checker work is intended to produce the same result, but in a slightly different way, by dividing the general volume of smoke and gases into a number of small currents and causing more intimate contact with the fire-brick surfaces.

So far as disposing of the smoke is concerned these appliances can be made to produce good results with careful firing. Their capacity in this respect is, however, comparatively limited, being dependent upon the proportion of heating surfaces to the volume of gases and smoke to be heated, and also upon the proper attention

to clear combustion, which supplies the heat to the storage surface, with the fresh coal firing which calls for the heat stored up. Another and more serious objection is their want of durability, and hence comparatively high cost, due not only to the actual repairs, but to the interference with regular operations as well. Devices of this character cannot, therefore, be regarded as affording a satisfactory solution of the smoke problem.

Hollow Walls for Preheating Air.

A number of patents have been taken out based upon this system, but they are all likely to fall short of satisfying the requirements specified. With careful firing in boilers performing moderate and uniform duty this system forms more complete combustion above the fuel bed by supplying heated air through a number of small holes in slits in the walls of the fire place and the bridge. It need scarcely be pointed out, however, that the capacity must be too limited to make its application to our boiler service of any material advantage. Other and well-founded objections are that flues in the walls of a boiler setting are likely to make the construction less stable and durable. The openings also for the admission of air to the fire place readily become clogged and suffer from the ignorance and unfaithful labor frequently found in boiler service.

Coking Arches or Chambers.

This system is a favorite one with many inventors of smoke-preventing devices. It consists in constructing a chamber in front of or an arch over the forward part of the fire place, where the fresh coal is charged and retained until the greater part of the volatile matter is drawn off. The resulting cake is then pushed to the rear to serve as the hot bed over which the volatile matter from the fresh coal in front is made to pass. These devices are intended to accomplish more fully what is aimed at in the system of firing in an ordinary fire place, known as coke firing, which consists in firing in thin layers and small quantities at a time over the forward part of the grate and keeping the strong, clean heat of the glowing coke near the bridge wall.

For disposing of smoke these devices are effective only as far as the fireman is careful in working the fire, and the amount of coal to be burned in a given time is limited. The use of arches, &c., in the fire place is open to the objection that such constructions are necessarily short-lived, exposed as they are to high heat, changing temperature and fluxing ashes.

Double Combustion.

Applications of this system have been attempted in many ways. Some have taken the form of duplicate fire places, which are charged with fresh coal alternately. Suitable dampers or valves cause the smoke and gases from the freshly charged grate to pass beneath and thence through the other fire bed, which consists in the main of glowing coke. In other cases there is but a single fire place, a portion of the smoke and gases being drawn by means of a fan blower from the breeching after having passed the boiler and forced under the grate to be passed through the fire bed a second time. It is clear that in passing such a large proportion of useless gases through a fire bed much of the air needed for combustion will be crowded out and heat will be absorbed in raising the temperature of these useless gases to that of the furnace. The double furnace requires extra room and the single furnace a fan blower, and both require more skill and attention than can be expected of the average fireman. Those applications of this system which have been tried have generally proved short-lived.

Downward Draft Furnaces.

These have been applied in a variety of forms and under various patents for a number of years. They consist essentially of a fire place, with the back closed so that there is no direct communication for the smoke and gases to pass away under the boiler except downward through the fire bed. The closed back is formed either by a water leg from the boiler, which passes below the level of the grate, or a drum set below the level of the grate and connected at either end with the boiler by tubes, the space between the drum and the bottom of the boiler shell being bricked in solid. Owing to the intense heat upon the grate, it is necessary to substitute a water-tube grate for the ordinary bars, and these water tubes are connected at the back with the water leg or drum, at the front with the boiler shell by means of headers and connecting tubes. All these parts, therefore, belong to the water circulating system of the boiler and supply so much additional heating surface.

By such a device the combustion of fuel is effected in a much more rational way than on the ordinary grate. The fresh coal is as usual charged on the top of the bed, but the air enters from the top, and therefore cooler part, quickly gaining heat from contact with the heated coal, and passes with the smoke and distilling volatile matter through the bed of incandescent coke below. The separated carbon and all gaseous products thus become intensely heated. The moisture of the coal and the combined water of the volatile matter are decomposed into hydrogen and carbon monoxide, which, with the aid of additional air supplied below the grate, burn with useful effect, while the separated carbon disappears into invisible carbon dioxide gas.

In order to get the requisite amount of opening for draft, the water tubes forming the grate must be spaced at greater distance apart than is the case with ordinary grate bars. Some of the fuel will, therefore, drop through, impelled by the force of the draft added to that of gravity. With caking coals, such as most of our Illinois coals, the loss from this source is not great under moderate firing; when, however, the fires are pushed and frequently worked with a bar to loosen the mass of coke or to clean the grate, considerable coke falls through. This has led to the adoption of an auxiliary grate of ordinary type, set some distance below, and through this all the air is delivered for the combustion of the gases issuing below the upper grate. As the lower grate receives only the incandescent fuel falling from above the space between the two grates, it is in a favorable condition for completing the combustion, being highly heated and supplied with heated air.

Such a system is well adapted to insure a good smoke record even when the fire is forced, and to a large extent with careless firing. It has the advantage, also, of being readily attached to a variety of boilers, and such attachment serves to increase the heating surface and hence the capacity of the boiler.

The objections to this type of smoke-preventing device, in any form in which it has been presented, arise mainly from defects in construction, which, although more or less serious, can be overcome. The arrangement for admitting air for the lower grate through the floor plates in front of the boiler is defective in that it does not permit of control of the air current. Excessive quantities of air enter, causing unnecessary waste of heat and a lowering of efficiency.

The water tubes of the grate and the connecting pipes are liable to unusual strains at the joints, and these latter are not altogether reliable. The water leg or drum, which acts as an inverted bridge, is subjected to intense heat, as are also the tubes of the water grate. Unless our St. Louis water is purified, scale will have a tendency to deposit at such places, especially on the lower surface of the water leg or drum, whenever there is any imperfect circulation. Any marked deposit of scale on these surfaces would cause the metal to run rapidly and give way. While serious difficulties have not resulted to any great extent from these defects, there is always more or less danger, especially where high pressures are carried, and these defects should be overcome before the system can receive unqualified approval.

In many boiler plants it would be difficult to apply this system owing to the lack of necessary space. A distance of 2 feet would be required between boilers, or pairs of boilers, to permit of cleaning the water leg or drum. It is necessary also to have a greater depth of 18 to 24 inches. Notwithstanding these various objections, the system has so many valuable features that it gives great promise for the future, and is well worth the attention and study required to secure the needed improvements.

Automatic Stokers.

There is a great variety of these devices, some of which are applied independently and others as auxiliaries to other types of smoke-preventing devices. The principle involved in their operation is to secure regular and uniform feeding of coal to the fire place by mechanical action instead of the irregular and unreliable service of the ordinary firemen. The mechanical action may be applied in the form of screw or hopper feeders to fixed inclined grates or to movable inclined or step grates. Most of these require the coal to be sized to nut, pea or slack grades, and but few are capable of handling to advantage lump coal or "the run of the mine." The coal when properly sized is fed with great regularity, thus doing away with the periods of heavy smoke development and clear firing. The gas and smoke are therefore distilled from the coal uniformly and near the upper or forward part of the grate, changing the fuel to incandescent coke as it approaches the lower end of the grate.

While automatic stokers are capable of giving good results under favorable conditions, their limitations are such that they cannot be regarded as applicable to any important extent for the boiler service of St. Louis. They require that a coal be used which does not readily cake, and which does not clinker to any serious extent. The boiler must be of ample capacity also so that no forcing is required. When, as is so generally the case here, a boiler is forced, the tendency of the coal to cake and clinker is greatly increased. The moving grate bars often fail to prevent caking, and the clinker is liable to choke the bars and impede their action. To clean a fire by hand where an inclined or a step grate is used is a very laborious and tedious undertaking for the fireman, and he is too apt to shirk it or perform it inefficiently. Another limitation lies in the fact that although automatic stokers are provided with devices for varying their speed they cannot act as promptly nor follow the variations in demand as closely as the fireman with shovel and slice bar. With our caking and hard clinkering coals and overworked boiler plants any system with such limitations is likely to prove worse than useless as a device to diminish smoke or economize fuel.

The fact must not be lost sight of that in using any form of smoke-preventing device greater care must be exercised in the examinations of the boiler and that more frequent cleaning of the interior is required. The better the combustion and the higher and more concentrated the heat resulting from this the greater the

danger of overheating and burning the portions of the boiler heating surface on which mud or scale may lodge. It is well known that mud or scale will more readily settle on those portions of the furnace sheets receiving the most direct action of the flame, since rising currents will always be established, these inducing return currents from other portions of the boiler, which sweep scale and mud and all suspended impurities to these points. In those devices in which danger points are covered or obscured from the eye of the fireman or engineer the danger is, of course, increased. Boilers of inferior design in construction, or defective to any extent in circulating action, will be rendered less secure by the application of any such devices as promote more efficient combustion. Your committee therefore inclines to the belief that before a general adoption of these devices the use of a simple but effective system of purifying the feed water before it enters the boiler will be necessary.

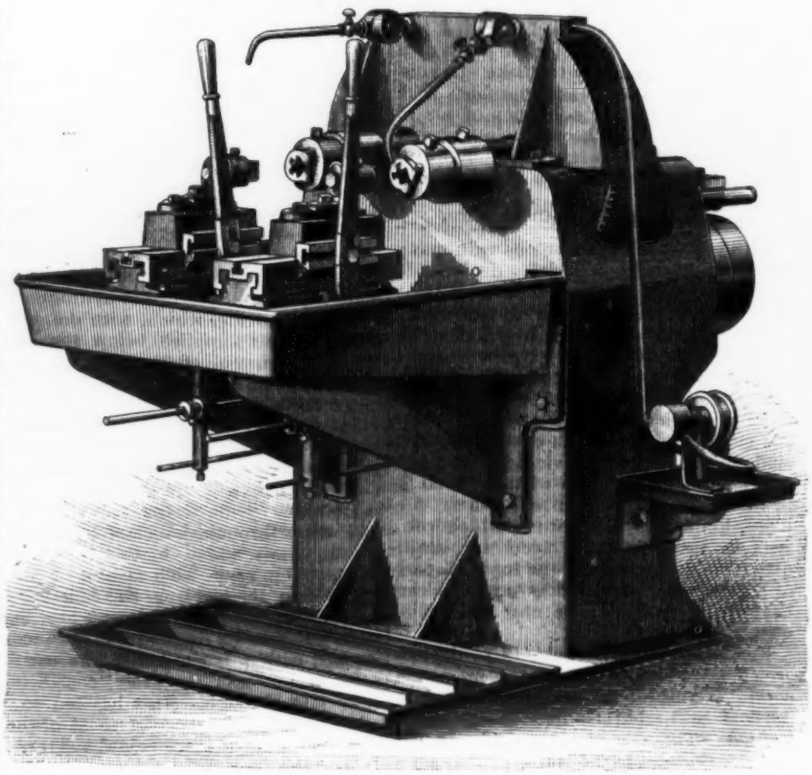
The report concludes with the recommendation of an ordinance declaring the emission of dense visible smoke to be a nuisance, and providing for its suppression within 180 days after the enactment of the ordinance. Also for the appointment of smoke inspectors and the creation of a commission of three competent persons who shall not be directly or indirectly interested in the manufacture, sale or construction of any furnace or other article having practical relation to the production or prevention of smoke. This commission is to test any devices for smoke prevention, under certain conditions; determine the applicability of smokeless fuels for various uses, and decide the conditions and liabilities under which manufacturing and other parties cannot wholly or reasonably prevent the occasional production and emission of dense smoke.

In the appendix it is stated that in 39 carefully conducted tests the smoke-preventing furnaces showed only 74 per cent. of the capacity of the common furnaces, reduced the work of the boilers 28 per cent., and required about 2 per cent. more fuel to do the same work. In another case with steam jets the fuel consumption was increased 12 per cent. for the same work.

Pedrick & Ayer of Philadelphia have just completed the sixtieth Richards open-side planer, of their own pattern, made in their shops. Inquiries relative to them have, we are informed, been recently received from various foreign countries where they are not patented, as they are in England and Germany. The machines take their name from their inventor, John Richards of San Francisco, and the right of manufacturing them was acquired from him by Pedrick & Ayer two years ago. George Richards, a son of the inventor, introduced them into Great Britain, where he manufactured them at Broadheath, near Manchester, England, and his factory there is at present turning them out at the rate of one every day. Pedrick & Ayer are about to make a heavier tool of this type than any hitherto constructed either by themselves or the English works, which is calculated to have a planing capacity of 12 feet in length by 42 inches width. They are being made of several dimensions from the small 30 inches by 12 inches to the one above mentioned. One seen lately at work in their shop having a capacity of 8 feet by 25 inches is a most useful tool, having at its side a 9-foot pit. It is capable of managing very heavy work, and was planing a casting weighing 5000 pounds, which an ordinary 36 x 36 housing planer close by was unable to undertake. The 126th Pedrick & Ayer's milling machine turned out by the firm since they commenced making them four years ago has just been finished, and will be shipped at once. Another tool of their special manufacture which is in constant requisition is the wing centrifugal grinder, by which the water is fed on the face of the stone, carried across it by centrifugal force and returns into the tank below. The wheels are found most useful in the firm's own workshops, and are erected at frequent intervals on each floor, one being calculated for the use of every six men. Mr. Pedrick stated that he has found from experience that the larger wheels are the most satisfactory in points of economy and efficiency.

Solid Die Automatic Bolt-Threading Machine.

The Webster & Parks Tool Company of Springfield, Ohio, the makers of this machine, state that it is introduced in order to meet the difficulties met by manufacturers of screws and bolts in turning out large quantities in the least possible time from rough iron which is neither round nor true to size. It is made in three sizes of two, four and six spindles. The fact is dwelt upon that with the solid die machine the extreme change from the shortest and smallest bolt to the longest and largest can be made in one minute's time, and that in making these changes it is only necessary to stop the spindle upon which the change is desired. The machine is so arranged that some of the spindles may be used for special or other tapping while the others are threading bolts or studs, and it is made so as to receive all kinds of special fixtures for threading and tapping purposes. It always reverses within one-quarter of a revolution of the spindle. In tapping nuts there are from two to four nuts on the cutting part of the tap at the same time.



SOLID DIE AUTOMATIC BOLT THREADING MACHINE.

The Lafayette Car Works plant, at Lafayette, Ind., was sold on the 30th ult. to a Lafayette syndicate for $39,500. The bidding started off at $15,000, an agent of M. E. Ingalls of the Big Four Railway running the figures up to $39,000. Some months ago the car works went into the hands of a receiver and the sale was under orders of the Federal Court. Judge Woods of Indianapolis was on the ground to act on any application for an extension of time or change in the terms of the sale, but no changes were made. The total indebtedness of the works was $296,000. The largest individual creditor was C. F. Birdseye of New York, whose claim amounted to $200,000.

A table showing the railway extensions under way and projected in this country is printed in the latest number of the *Railway Age and Northwestern Railroader*. There are 470 different lines, embracing a mileage of 28,259. At present the aggregate mileage of the United States is more than 170,000. Of the new railway enterprises which are under survey or construction 2176 miles are in Alabama, 1673 miles in Georgia, 1496 miles in Florida, 1410 miles in Pennsylvania, 1358 miles in Minnesota, 1169 miles in Illinois, 1115 miles in Tennessee, 1071 miles in Texas, 1027 miles in Arkansas and 448 miles in New York.

Balloons were recently used by the German soldiers, on the borders of Russia, to observe the military movements in the country last named, and some of the observers conjectured that the Germans have made great improvements in the steering appliances.

Frederick G. Ely of 29 Broadway, New York, Eastern representative of the McGuire Mfg. Company, the National Hollow Brake Beam Company and the Q. and C. Company, spent some days in Chicago last week. Mr. Ely occupies a peculiar position, inasmuch as he represents Western manufacturers of railroad supplies in the Eastern market, thus apparently reversing the natural order of things. He has built up a large trade on the Allegheny slope in his specialties, numbering all the trunk lines among his customers.

The Diamond State Iron Company.

Since the destruction by fire of the greater part of their plant in June last, the Diamond State Iron Company of Wilmington, Del., have embarked with renewed vigor. As makers of iron and steel, of refined and common bar, and of the smaller articles of general use for structural purposes, bolts and nuts, spikes, rivets and washers, and of horse and mule shoes, the firm have achieved eminence. Their productions are being shipped to many distant points beyond the limits of this country. We are informed that within the last few months they have forwarded large consignments of goods in response to orders from Mexico, Central and South America, Cuba, the West India Islands, and even as far as the Sandwich Islands. The shops have been and are in active work, running to full capacity. At the present moment over 1200 hands are in constant employment, on double turn. The average output is 1000 tons per week, and when it is understood that this amount is largely made up of small articles of manufacture, the magnitude of the industry will be more fully appreciated.

The consumption of raw iron at this establishment for the past year was computed at 50,000 tons, and this amount will doubtless be exceeded during the current year. The company's works occupy some 8 acres of ground on opposite sides of the Christiana River, their shops being in easy connection by a bridge over the creek. These consist of the Diamond State Rolling Mills, foundry, blacksmiths' shop, track, bolt and nut machine shop, and numerous stores and offices, comprising the original works run by the firm when first incorporated, which are situated on the north bank of the river. On the same side is shop No. 2, formerly the manufactory of the Hare & Morgan Company and afterward of N. D. Stotsenberg & Co., which was acquired by the present owners two years ago, and it is now used as a factory for bolts and nuts, spikes and rivets. Considerable additions to this portion of the works are in contemplation and will be shortly inaugurated.

On the south side, immediately opposite, are situated still larger works belonging to the Diamond State Company, known as the "Old Ferry Mills," and which are the most recent additions to the establishment. The present buildings have been erected in the place of those burned down last year.

The whole of the original Old Ferry Mills were totally destroyed with all the plant and machinery, the foundry department alone escaping. In the short space of 60 days the new shops were built and in operation. They were their own architects and builders, the whole fabric being erected by their own ordinary staff on a greatly enlarged and improved plan. Although laboring under the disadvantage of using skilled mechanics and laborers in building houses and doing work outside their usual line, the result has proved satisfactory. The buildings consist of several large shops and warehouses; the two largest, known as shops No. 1 and No. 2, are 400 feet long by 250 feet wide and 600 by 150 feet respectively. Each has a railway track through its entire length, being so designed that the raw material is run directly into one end of the trucks, unloaded, passed through the various processes of manufacture, progressing by degrees through a succession of furnaces and machines, so that by the time it reaches the opposite end of the shop it has been converted into finished goods, packed and ready for shipment or storage.

These mills contain 20 puddling furnaces, rolling trains and machines for the manufacture of the varied articles which the company turn out, including the steel and iron bars and rods and angle iron for structural purposes, the round iron in sizes from ¼ inch to 4 inches diameter; square iron ¼ inch to 3 inches square, and flat iron from ⅛ to 8 inches wide; also fish plates for railroad purposes, and railroad, dock and boat spikes, as well as English dog-eared spike, of which they are sole makers in this country, bolts and nuts, rivets and washers of all descriptions.

A very important branch of business with the Diamond State Iron Company is in the horseshoe manufacture, which has been growing to large proportions of late. They make the shoes both of iron and steel, the different patterns being known as extra light, light, medium, heavy and mule—the special feature of their shoes being their form, which corresponds in shape to the animal's hoof, and an improvement they have introduced in the under cut of the nail hole, which being slanting, instead of straight up and down, gives the nail when drawn in a firmer grip of the hoof. Each shoe turned out is stated to be sorted three times, all found in the slightest degree imperfect being rejected. The spikes, bolts and rivets are made in shop No. 2 by a series of automatic machines. These small articles are packed in kegs made on the premises, marked and stored ready for shipment. A very large stock is kept on hand, the establishment possessing ample storage facilities.

The most recent addition to the plant is a large warehouse just completed, 200 feet by 125 feet, which is to be devoted entirely to the storage of horseshoes, possessing a capacity of 200,000 kegs—each keg containg from 100 to 200 shoes. Besides these houses, the Old Ferry Mills contain a large foundry, a carpenters' shop and store rooms, as well as a machine shop, where a number of machinists are constantly engaged on the repair and manufacture of machinery for home use. One day in each month is devoted to an examination and repair of furnaces and overhauling of machinery, when fires are put out and the usual work stopped. This they find very effective in preventing accidents and break downs, and insuring that no inferior work is turned out in consequence of the bad state of furnaces or machinery.

In the blacksmiths' shop 22 forges are in pretty constant use. One circumstance which may be regarded as greatly conducing to the prosperity of the company is the unusual advantages they possess for the transport of their goods both by land and water. Three trunk lines of railway—the Baltimore and Ohio, Pennsylvania Railroad and Philadelphia and Reading—run directly through their works; and from their situation on the water side vessels drawing as much as 17 feet are able to load at their wharves, at low tide, for the shipment of goods to Philadelphia and all parts of the Atlantic seaboard by the Delaware River.

The Diamond State Iron Company were formed in 1853 and incorporated in 1865; and the present active members of the firm, as well as the heads of departments, have almost without exception all grown up in the business. The president and treasurer has been connected with the company for 27 years.

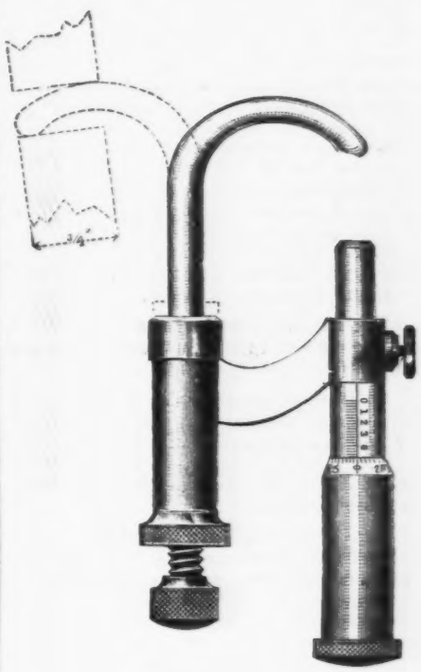
The following are the names of the present officers: President and treasurer, George W. Todd; vice-president, L. A. Bower; secretary, H. T. Wallace, and general manager, John Todd.

The company have branch offices in New York, Philadelphia, Boston, Chicago and Portland, Oregon; and they are specially represented in St. Louis and Cleveland, Ohio.

The Ways and Means Committee of the House has decided to report favorably the Bunting bill for the reduction of the duty on tin plates from $2\frac{2}{10}$ to 1 cent per pound, and for the removal of duty altogether after October 1, 1894; and for a rebate on unbroken packages held by importers or consumers on October 1 next equal to the difference between the present duty and that established in the bill.

The Riehle-Sloane Micrometer Caliper.

The engraving represents a new micrometer caliper made by the Riehlé Bros. Testing Machine Company of Philadelphia. It has one leg movable to enable it to be inserted in small holes in plates, boilers, &c., and is designed to measure the thickness of material up to 1 inch at any place selected. While originally designed for the steam-boiler inspection service, it has been found useful in many unlooked-for directions, as it can be used as an ordinary micrometer caliper as well as when the movable leg is available. The measuring leg is graduated to thousandths of an



The Riehle-Sloane Micrometer Caliper.

inch, as in the ordinary micrometer caliper, but is also provided with a lock (shown in the knurled set screw in the cut) for fixing the measurement. A slight pressure is sufficient to secure it.

In operating through small apertures—a ¼ inch gas-tap hole is large enough—the knurled nut is released two turns; then the movable leg is pressed downward until a pin fitting into a socket on it is disengaged, and thereby allows it to be turned around on its axis. The movable leg is then hooked through the hole and turned until the feather slips into the slot, which brings the two caliper points into line, and is thrown up against its shoulder by a spring, after which the knurled nut is turned up tight again. The graduated leg is then adjusted and locked, the movable leg pressed down and turned as before and the caliper removed. When calipering in dark places, the measurement being fixed, the caliper can be taken out into the light and read, instead of being obliged to read it before removing. The small hole necessary for inserting the caliper in boiler shells is closed by driving a copper rivet instead of tap and plug.

THE WEEK.

It was reported on the 30th ult. that the Pennsylvania Railroad had secured control of the William Penn colliery, near Shenandoah, owned and operated by E. & G. Brooke of Birdsboro. It is one of the largest collieries in the coal regions, having an annual tonnage of about 300,000 tons, and its product has been shipped over the Reading Railroad.

The Chinese evade the exclusion laws of this country by obtaining naturalization in Canada and then claiming right of entry under treaty as British subjects.

In relation to silver, Senator Morgan introduced into the Senate, on the 31st ult., resolutions instructing the Committee on Finance to make an examination and report to the Senate upon certain questions contained in the resolutions. The design is to furnish a basis for discussion, and to give occasion for unwilling Senators to define their position.

The interests opposed to the New Jersey bill for the legalizing of the lease to the Philadelphia and Reading Railroad Company are confident that they could have the measure declared unconstitutional if the Governor should approve of it. They argue that the law which allows the Governor to approve a bill within 30 days after its passage is contrary to the Constitution, which declares that a bill shall become a law if not returned within five days, unless the Legislature shall have adjourned and so prevented the return, in which case the bill shall fail. The Legislature did adjourn within five days and the Governor allowed the five days to pass without approval of the bill.

Later information makes a combination of the manufacturers of umbrellas seem less probable.

It is reported that the United States Rubber Company was incorporated at Trenton, N J., with a nominal capital of $50,000,000. The purpose is the control of the manufacture and prices of india rubber goods.

The bottoms of the Navy Yard tugs, Nina and Fortune, which were covered some months since with various kinds of anti-fouling and anti-corrosive paints, are to be examined by a board of navy officers to ascertain which kind of paint has proved to be the most effective.

The New York *Commercial Bulletin* advocates the removal of the duty upon refined sugar, to relieve the public from the sugar monopoly. and argues that it would in no sense cripple the sugar combination, while it would be a check upon extortion by them, under the penalty of foreign competition.

Professedly to encourage shipbuilding in this country, Bourke Cockran introduced into the House, from the Committee on the Merchant Marine and Fisheries, on the 30th ult., a bill which provides for the admission to American registry of steamers of the highest grade now owned by foreign corporations, nine-tenths of whose stock is held in the United States, if the American stockholders obtain a complete transfer of the vessels, and build in the United States other steamers equaling in tonnage those acquired from the foreign corporations.

It is reported that negotiations are in making for a combination of the safe-manufacture interests of Marvin, Herring and Hall. By and by everything will be on trust.

The average speed of elevators in office buildings in and around New York is 300 feet a minute. The fastest one is said to be that in the Union Trust Building, Wall street, with a motion of 600 feet in a minute. The English call these machines "lifts"—a better word in size, precision and origin.

It is reported that the New York, New Haven and Hartford Railroad Company have acquired control of the New York, Providence and Boston Railroad, and with it the lease of the Providence and Worcester Railroad.

According to the Philadelphia *Press*, the consolidation of the sugar refineries will put that interest under the control of outside capital, and will have an unfavorable influence upon the labor and general business interests of Philadelphia. Spreckels retains his San Francisco plant and his Sandwich Island plantations.

In relation to the Philadelphia and Reading Railroad combination, the committee on Interstate and Foreign Commerce of the House on the 29th ult. authorized inquiry to be made of the Interstate Commerce Commission whether they had begun any investigation of the matter.

Four cotton presses and 80,000 bales of cotton were burnt at New Orleans on 3d inst.

In the lower House of the Hungarian Reichstag, on the 1st inst., Dr. A. Wekerle, Minister of Finance, said that owing to the present state of European affairs a reduction in the expenditures for the army was impossible. The country must be prepared for additional, though gradual, increase in the army expenditures in view of the growing armaments of foreign powers. The representatives applauded loudly, and passed the budget as recommended.

The steamer Missouri arrived at Libau, on the 31 inst., with the second cargo of flour and corn meal for the starving peasantry of Russia.

The New York *World* suggests a driveway along the Hudson River, from Seventy-second street north, as a substitute for the one attempted in Central Park.

By agreement among the heirs of Samuel J Tilden, it seems that about $1,700,000 will be available for the public library which was in the mind of the testator.

The Niagara Falls power tunnel is having its brick lining put in. The coffer dam at the mouth of the tunnel is nearly finished and the wheel pit has been sunk to a depth of about 30 feet.

The Thomson-Houston Company are building an electric locomotive of 500 horse-power, which will be capable of drawing ordinary trains at the rate of 40 miles per hour.

The Government of Mexico has made a contract with E. L. Corthell of Chicago, and others, to complete the railway across the Isthmus of Tehuantepec, between the Atlantic and Pacific Oceans, which was begun by an English company some time ago. Mr. Corthell and his associates are authorized to organize a company, issue securities and build the terminals and the two harbors for the largest class of vessels.

Inquiry in the British Parliament respecting Hebrew immigration brings out the fact that large numbers are expected from Russia during the coming summer, but so long as ports in the United States remain open to them no apprehension is felt and no action will be taken.

The Corbin Bridge bill, which is intended to provide an outlet for the Long Island Railroad and permit connections with the Grand Central Depot in New York, is under discussion in the Legislature of this State. It is proposed to build a station at the New York end of the bridge, similar to that of Charing Cross in London.

Some of the acute observers in Washington pronounce the Free Silver bill dead.

A scheme is under consideration for the division of the Territory of Utah between the States of Colorado and Nevada.

There is promise of a four-hour route to Boston, via New Haven, New London and Providence.

Trade Publications.

THE DETRICK & HARVEY MACHINE COMPANY of Baltimore, Md., have just issued a catalogue describing their open-side iron planers, open-side extension planers, shaping machines and special tools. The name "open side" indicates an important feature embodied in this style of planer, in that it has but one post, which gives an extremely wide range and a great advantage over other planing machines. The open-side planer is in no sense a "special" tool, performing as it does the regular line of work as economically and as accurately as the ordinary two-post planers of equivalent size. A comparatively small tool of this type will plane a great variety of work which would necessitate a much larger and more costly machine of the regular style. It is therefore a valuable and economical tool for the machine shop. As an illustration, it has been demonstrated that not only will a 30-inch open-side planer perform with equal accuracy and dispatch all that class of work done on a 30-inch planer of the regular style, but, in addition, a large amount of work necessitating a 36, 42, 48 inch, or even larger two-post planer, thus proving economy in first cost. The following is given as an example of what one of these machines will do: On a 48 x 36 inch machine a planer post 13½ feet high, 8 feet wide and 3 feet deep, weighing 20,000 pounds has been planed all over.

GRANT'S GEAR BOOK for 1892, issued by the Lexington Gear Works of Lexington, Mass., has been received. We always expect, when we receive anything from the pen of Geo. B. Grant on the subject of gears or gear-cutting machinery to find valuable information. In the present case we are not disappointed. The catalogue not only enumerates the wide range of gears made by the company, but it also illustrates the method of drawing spur gears, drawing the standard involute tooth, bevel gears, elliptic gears, &c.

FROM THE HUYETT & SMITH MFG. COMPANY of Detroit, Mich., we have received a catalogue describing the Smith hot-blast apparatus and showing many buildings heated and ventilated by their system. The apparatus consists of a fan and coils of steam pipe placed on one base or platform, the coils being inclosed in a sheet-steel jacket, with wrought angle-iron frames. The fan attached to the heater is what is known as the Smith disk fan blower, the shell and fan blades being constructed of the best homogeneous steel, the steel shaft being of large diameter, with long and perfectly adjusted bearings lined with anti-friction metal. The heaters are made of the heaviest steel or wrought-iron pipe, and all the headers, return bends, nipples and fittings throughout are extra heavy These heaters are made in one, two, three or four sections, as may be desired, for using either live or exhaust steam, separately or combined, and every heater is tested to 200 pounds hydraulic pressure.

IT HAS BEEN THE CUSTOM of the E. W. Bliss Company, Limited, of Brooklyn, N. Y., for a number of years to issue a handsomely bound book of from 200 to 400 pages containing carefully made wood cuts of their machines and tools, with tables of dimensions, capacity, &c. These books have been attractively bound and each edition has cost much money. Recently the idea of sectional catalogues, or catalogues to be compiled according to the individual wants of customers, has been introduced. For the purpose of inclosing with letters, duplicate pages of the bound catalogue, as heretofore employed, were printed. The new idea is to use these pages exclusively, having them punched, ready to fasten in a temporary binder with appropriate title page, &c. To carry out this plan each page, of necessity, has been made complete, so far as illustration of device, table of prices, &c., are concerned. Single sheets are used in inclosing in letters, and then, as already mentioned, a number of them are combined from time to time to meet special requirements.

The Iron Age

New York, Thursday, April 7, 1892.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, - - - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - HARDWARE EDITOR.
JOHN S. KING, - - - - BUSINESS MANAGER.

The Manufacture of Light Sheets.

The production of light sheets is expanding now in some proportion to the advancement made in other branches of the iron and steel trades. There has, perhaps, been no period in the past, except, of course, when all kinds of business were abnormally depressed, that did not see at some time in the year an absolute scarcity of light sheets, due to the domestic supply falling short of the demand. When the duty was advanced on tin plates we pointed out this fact, and called attention to the necessity of building more sheet mills to meet the requirements of the trade for black sheets. It was seen that no considerable part of the output of the sheet mills then in existence could be diverted to the manufacture of tin plate, although the claim had been advanced by overzealous tin-plate advocates that as soon as an adequate duty was assured every maker of light sheets would add tinning stacks to his plant and would tin at least a part of his product. Those who sought to purchase black sheets for tinning can testify how difficult it was for a long time to procure them in even reasonable quantities. The ordinary black-sheet trade was too good to be even partly abandoned for the manufacture of tinning stock.

This condition of affairs is now being overcome. The past year has seen old sheet-rolling establishments add more mills to their plant and new concerns coming into the field with excellent equipments. The growth of the black sheet trade for the supply of the general market has been offset to some extent by a heavy increase in the demand for galvanized sheets which has absorbed no small part of the enlarged output, but at the same time a perceptible gain has been made. There is less complaint to-day of the difficulty in getting black sheets suitable for tinning than at any time since the manufacture of tin plate was begun, and this in face of the fact that the demand for such sheets is steadily increasing as new tinning plants are started. For a time this was a most discouraging feature of the domestic tin-plate trade, as tin-plate orders which had been taken had to be canceled for non-delivery within the specified time, and the new industry suffered much discredit thereby. Great doubt existed in the minds of those who failed to receive the tin plate ordered as to whether the excuse given for the delay was the true one, and whether it was not more likely that the domestic tin-plate makers had encountered formidable obstacles in the tinning process itself.

Apprehension exists in some quarters that the light-sheet trade is in great danger of being overdone, with so many old establishments increasing their capacity, and so many new ones entering the field or making preparations to do so. In this feeling we do not share. The field is so great that it is not likely to be thoroughly covered in the very near future. Once the manufacture of tin plate is firmly established on American soil, it will be pushed until at least the entire domestic consumption is covered, or those who are engaging in the business are unlike other American manufacturers. Here is an almost boundless expanse to be occupied. While this work is going forward, many of the standard sheet mills must from time to time be called upon to furnish sheets for tinning to those who do not possess adequate facilities for manufacturing their own sheets. A constantly growing demand for light sheets thus seems to be assured far into the future. The price, however, may fall lower than now, but that would be no special calamity with costs reduced to correspond. In fact, the strong probability of a considerably lower level being struck in the market price of light sheets enters largely into the calculations of the builders of some of the new mills. Economics are therefore being introduced wherever possible.

One circumstance is likely to aid the industry, which has not received the full consideration to which it is entitled. The invasion of the territory of the steel cut nail by the wire nail has left without adequate employment a good deal of efficient plant, notably in the department of the nail-plate mills. A number of large cut-nail concerns have Bessemer plants, and are crowding the market with billets until that trade has become very unprofitable. They could utilize their plate mills by breaking down the tin-plate bars of their own manufacture to plates of the gauges readily rolled on nail plate trains. This would relieve the tin-plate mills of a part of the rolling-mill work by allowing them to start with No. 10 to No. 12 plates, and would be conducive to more economical manufacture.

The migration to the West of Eastern manufacturing establishments promises to be as great this year as in any previous year. The vicinity of Chicago continues to possess strong attractions for them. There has been a notable increase of late in schemes for the establishment of manufacturing towns contiguous to that city. The success of the town of Harvey and two or three other ventures has caused these new projects to be brought forward in the hope that some part of the current may be diverted toward them. The inducements held out to manufacturers in other localities are in numerous instances of a most tempting character. Hence it is not surprising to find manufacturers taking advantage of them, especially when they had already decided that vigorous measures of some kind were needed to hold their Western trade. Chicago manufacturers of important materials consumed by makers of hardware and other highly finished products state that they are now in almost constant receipt of letters of inquiry as to cost and quality from Eastern concerns contemplating the removal of their business to the West either wholly or in part

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Transmission of Power at Niagara Falls.

One of the most timely papers read at the Buffalo Convention of the National Electric Light Association was by Carl Hering on transmission of power, special attention being paid to methods of utilizing and conveying to Buffalo a portion of the power of Niagara Falls. First the author considered hydraulic, pneumatic and wire-rope transmission, giving as the efficiency of each, respectively, 18, 39 and 11 per cent. for a distance of 13 miles. A rather novel way of dealing with the transmitting of power is that of considering the cost of transporting coal itself from the mines to manufacturing cities. In Philadelphia the price of a ton of coal is doubled by the cost of its transportation from the mines, and therefore an efficiency of only 50 per cent. is obtained in the transmission.

The most essential portion of the paper, and the one of most value, since the author is thoroughly conversant with the subject, is that discussing the systems of electrical transmission. To be successful at all for long distances requires the use of very high potentials, as otherwise the cost of the line would make it impracticable. Continuous currents, to be available, must be generated directly by the dynamo at that high potential, as there is no means at present known of converting a low-tension continuous current into one of high tension without the use of moving machinery. Experience and experiments have shown that it is not practicable to exceed 5000 or 6000 volts at the very most on continuous current dynamos. It is thought, therefore, that the field is left tolerably clear for alternating currents for the following reasons: 1. Because alternating-current dynamos require no commutator. 2. Because such currents can be converted readily from a low tension to a high tension, and the reverse, with only a small loss in each transformation. An alternating current dynamo for generating low potential currents is the simplest type, and a transformer requiring no moving machinery is a very simple thing to take care of, if, indeed, it requires any attention at all.

The only important objection to the use of alternating currents is that they are not so suitable for running motors as direct currents are. The so-called synchronous motors are alternating-current dynamos used as motors. As their name implies, they must run at precisely the same speed as the dynamo, and many of them come to a dead stop if loaded so as to reduce that speed. The principal difficulty is found in the fact that they cannot be started readily, and all the load must be taken off before they can be started at all. The

opinion is expressed that before very long this problem will be solved by several methods, so as to leave but few objections to the employment of alternating currents.

There are two ways of transmitting power to great distances by alternating currents. One, used at the Ferranti Station in London, is to generate high-tension currents at the dynamo, and at the distant end transform these currents into low-tension ones. The second method, used successfully at Frankfort, consists in generating low-tension currents, transforming them at the dynamo station into high-tension currents, which are sent over the line and then transformed back to low tension. This method Mr. Hering thinks to possess more advantages than the first.

The following instances of electric power transmission in this country were cited: At Virginia City 500 horse-power transmitted ¼ mile, with an efficiency of 70 per cent., and at the Calumet and Hecla mines 400 horse-power transmitted 1½ miles, with an efficiency of 73 per cent. These are direct-current systems. One alternating plant at Telluride, Col., transmits 120 horse-power 2¾ miles, at a commercial efficiency of 75 per cent. It is necessary to go to the Lauffen-Frankfort plant in order to get data regarding the efficiency of electric transmission for long distances. Although the official tests have not been finished, it has been found that the efficiency from the dynamos at Lauffen to the lamps at Frankfort, a distance of 108 miles, was 72 per cent. when 80 horse-power was transmitted. Mr. Hering closed his paper by stating that Mr. Dobrowolsky, of one of the firms interested in the Lauffen-Frankfort experiments, was willing to contract to transmit 1000 to 5000 horse-power from Niagara to Chicago, about 500 miles, and that an efficiency of from 60 to 75 per cent. could be obtained without difficulty. These figures point to the decidedly superior efficiency of the electric methods over any of the others.

We find a remarkable statement in an article by Prof. Elihu Thomson on "High Potential Transmission" in a late issue of the *Electrical Engineer*. After briefly considering the several factors of the problem he says:

> Whether the condenser effects of a long line would introduce serious difficulties it is impossible to say, but provided that the rate of alternation or periodicity be kept low and the insulation maintained by covering every inch of the high-pressure conductors in, say, two inches thick of oil, it might even be possible to work with 500,000 volts. Allowing a loss of only 10 per cent., or 50,000 volts, with a double conductor conveying 200 ampères, each conductor having about $^1/_{12}$ of a square inch section, a distance of about 240 miles would be covered and the energy carried would be 100,000,000 watts, or over 130,000 h. p. These are striking figures, and are only given by way of illustration. They may never be needed to be used in practice, yet the difficulties of realization are less than at first appears; the condenser action of the line being the most serious matter to be dealt with. . . . Looked at from the standpoint of very high potentials, Niagara may be said to be gradually approaching the surrounding cities.

These remarks cannot be considered as due to the enthusiasm of a successful inventor. Professor Thomson is so intimately identified with the wonderful growth of the science of electricity, and constitutes such an essential part of its history, that his statements always merit the most careful attention.

Soft Steel in Bridges.

An exceptionally valuable contribution to the literature of the employment of steel has been made by F. H. Lewis, in a paper read before the Engineers' Club of Philadelphia, recently issued in pamphlet form, with the discussion which followed it. So far as Mr. Lewis deals with the commercial side of the problem, conditions have materially changed since he wrote his paper in October of last year. Then he reported that a general use of soft steel had not come to pass "for the simple reason that it costs more." He figured then, taking into account a 2 per cent. increased weight of steel, and a nominally higher price by 5 per cent., that the cost of soft steel was nominally a little over 7 per cent. higher than wrought iron. We question whether in certain sections of the country that nominal difference has not really disappeared entirely. Whether the position of the two metals may not be again reversed in favor of the puddled iron is quite another matter.

Mr. Lewis has, however, applied himself particularly to the study of what may be termed more strictly engineering problems, one very important phase of it being whether soft steel, after punching, constitutes a good tension member. He examines the 1882 1883 Watertown tests of riveted joints, and a series of tests of wrought iron, soft steel and medium steel made recently under the auspices of the Pittsburgh Testing Laboratory. Particularly interesting results are quoted, however, in a general way, of comparative tests of iron and steel made by one of the large works of Eastern Pennsylvania, on punched, reamed and drilled specimens of wrought iron and soft steel under exactly similar conditions. They were 6 x ½, 6 x ⅝ and 6 x ¾ inch bars, the steel having a tensile strength of 64,000 pounds, while the iron had a tensile strength of 52,000 pounds per square inch. Mr. Lewis summarizes the results to be as follows:

> I have checked up the entire series and find that the steel is very uniformly less injured by punching than iron, the average difference being about 10 per cent. in favor of steel, and this difference is essentially true of all tests save, perhaps, one in the series. Thus, if we rate the average ultimate strength of the steel in specimen tests at 100, the average ultimate of the iron in specimen tests would rate at 83; but rating the average ultimate of the punched steel on net sections at 100 per cent., the average ultimate of punched iron on net sections would rate at 71½ per cent. More than this, a comparison of the punched specimens with the reamed ones in both cases shows the iron to have been quite as much benefited by reaming as the steel.

So far as the evidence goes, Mr. Lewis makes the conclusion that the tensile strength of structural steel is injured rather less by punching than is that of wrought iron. In a subsequent communication he qualified this broader conclusion in a very important particular. Steel does hold its value, after punching, better than iron up to say ¾ inch thickness, but beyond that it decreases in value quite rapidly as the thickness increases, while iron remains more constant. This is accompanied by a gradual decline in the character of the fracture from fine silky to granular in the thicker material.

Mr. Lewis has embodied his investigations in elaborate specifications for bridge superstructure, in which he provides for the use of wrought iron, soft and medium steel for the different members. In bar iron for tension he calls for 50,000 pounds tensile strength, 26,000 pounds elastic limit and 18 per cent. elongation in 8 inches, while for soft steel the figures are 54,000 to 62,000 pounds and 32,000 pounds respectively, with an elongation of at least 25 per cent. For medium steel the elastic limit is raised to 35,000 pounds, the ultimate strength to 60,000 to 70,000 pounds, while the elongation is lowered to a minimum of 20 per cent.

On the whole, Mr. Lewis's presentation of the subject and his proposed specifications were received with approval, but opinions shared by many were voiced by Henry B. Seaman, who insisted that the absence of a fibrous structure made steel objectionable, and that the slightest flaw—so fine as to be imperceptible under the closest inspection—might under vibratory strains lead to the destruction of the member.

We believe that one principal point is usually neglected in discussions bearing on the relative standing of wrought iron and steel. The former can be made, and is manufactured, in all the grades from scrap stock together with a little cinder to double refined all muck bar iron capable of resisting any amount of torture. Soft steel is either good or it is worthless. There is no middle ground, there are no gradations in quality.

It is a remarkable fact, too, that as soon as engineers deal with steel, the most elaborate and sometimes absurd specifications are rigidly insisted upon. We do not mean to insinuate that great care is unwise or unjust. But it is somewhat astonishing that the same men will accept a lot of iron after simply running their eye over a pile as stacked in the mill yard, or loaded on cars. Old methods are good enough for iron, exhaustive and at times oppressive examination is the rule for soft steel.

The past few years have been notable for the large bequests and gifts to institutes of learning, but it is a source of much regret that, with hardly an exception, these benefits have been restricted to the older colleges, where the instruction is altogether, or at least in greater part, of a literary character the scientific schools, in which a large and constantly increasing proportion of people are interested, having received little aid from the gifts of the living or bequests of the dead. With the extremely limited means at its command no college of the latter kind has done more efficient educational work than Stevens Institute, which in its short ex-

istence has graduated many engineers eminent in iron and steel metallurgy, railroading and the manufacturing industries. Under able management the small income has been employed to the best advantage, but now and for some time past applications for admission have far exceeded its accommodations, and that, too, in spite of the fact that the standard of examinations for entrance has been repeatedly raised. With a view to increasing the facilities of the institute by the erection of a new building which shall accommodate the departments of chemistry, physics and languages, and thus give space in the present building for the much-needed extension in the departments of drawing, mathematics, engineering and applied mechanics, the alumni have undertaken to raise a fund of $50,000 for the purpose. They have already succeeded in collecting over $12,000 from their own numbers and the members of the faculty, though it is not to be expected that the graduates alone will be able to subscribe the entire amount. A general appeal is therefore made to all who are interested in Stevens Institute and its work, and as an added incentive, it is announced that subscribers of $5000 will be entitled to a perpetual scholarship. It will be pleasant to learn that this appeal has met with a generous response from those whose prosperity depends in no small degree upon the employment of thoroughly educated and well-trained engineers. As wealth amassed a generation ago is finding its way into the treasuries of the classical colleges, we may hope that the industrial fortunes now acquiring may be used in assisting the more needy schools where pure science and technology are taught.

Steel Building Construction.

Gen. William Sooy Smith of Chicago is an eminent civil engineer whose opinions are usually received with very great respect both by members of his own profession and others. He entertains very radical views, however, with regard to the use of steel in the construction of high buildings, and has of late years freely expressed himself in opposition to the dependence on this material which has grown to be such a feature in our large cities. On the 31st ult. he delivered a lecture on the erection of tall buildings before the University of Illinois at Champaign, in that State, in which he presented some conclusions which the advocates of steel construction are hardly likely to permit to pass unchallenged. Among other things he is reported to have given utterance to the following:

In view of the great hight and consequent great weight of our principal buildings it is important that materials should be used in their construction which unite in the highest degree lightness and strength with the other qualities of good building materials. And so steel naturally came to the front with strongest sinews and head erect—too proud to bend—saying to the architect and engineer: "Pile your mountain loads on my shoulders and place them in the firm grip of my hands, and I will hold them for centuries, though the storm wrestles with me and the earth quakes beneath my feet." The men of science accepted the proffered service and the men of affairs poured out their money to pay for it.

And, as a great building now goes up in Chicago a gaunt skeleton of steel first rises aloft, and this is gradually clothed from story to story with rigid flesh of stone and brick, tile and mortar, and with such integument it becomes a habitable edifice. But with each change of temperature the steel skeleton expands and contracts and becomes a creeping, crawling thing, apparently striving to tear off its clothing, especially if exposed to such heat as results from the burning of great quantities of combustible materials, such as are collected and stored in a mercantile building, or from the occurrence of great heat in the burning of adjacent buildings; and this last danger may threaten even an office building, which itself contains little combustible material.

And this in spite of the means usually employed to protect the metal from heat by the tile covering put upon it; for this covering will become so hot as to conduct enough heat to the steel to expand it and crack off the tile coverings. This has happened already, notably at the burning of the *Tribune* Building at Minneapolis about two years ago, which resulted in its utter destruction.

There may be steel buildings in which the fire proofing has been so well done that they will pass through an ordinary fire without such failure. But if the steel becomes even moderately heated, its stiffness will be measurably diminished and the tensile strength of the upright members so reduced as to cause them to bend and yield. This is more likely to occur as the horizontal beams and girders will at the same time expand unequally from the different degrees of temperature and throw the posts out of vertical and into buckling positions, in which case the building will be likely to come down with a crash.

Under these circumstances, if floors were built of perfectly rigid materials the unequal settlement would crack them into pieces and ruin them. The elasticity of the steel beams now used in the floor systems partially obviates this difficulty, but not wholly, as many floors in which they are employed—notably those of the Post Office and Custom-House Buildings—are badly demoralized and broken up by unequal settlements.

The remedy which General Smith proposes is evidently a return to the method of construction employed before steel became so popular. It is thus stated by him:

The difficulty resulting from the expansions and contractions of the metals employed in the construction of tall buildings may be obviated by protecting these metals absolutely from any considerable change in temperature, or by throwing out the metals altogether and substituting tile brick and stone as far as may be practicable.

There are now so many tall buildings in use in various parts of the country in which steel construction has been employed that the system is being not only practically but very thoroughly tested. It has thus far proved so satisfactory and so well adapted to this special use that more than one signal failure in strength or durability will have to occur before it will be abandoned in favor of the old style of massive masonry.

The assertion is very common among labor agitators and others who desire to foment disturbances among workingmen that there are 30,000 to 50,000 men out of employment in Chicago at this time. It is difficult to disprove statements thus made, as the facts are not directly ascertainable, and the belief obtains that the leaders of the workingmen are in a better position than anybody else to get at the truth, at least approximately. Some light, however, is cast on the subject by the general agent of a large employment agency, who stated last week that he could have furnished in March situations for hundreds of men more if he had been able to find them. In other words, the demand for workingmen was found by him to be greater than the supply available. One great fact like this casts doubt on the correctness of the claims made as to the great number of men out of work in leading cities.

The Bureau of American Republics, which is connected with the State Department, is threatened, in spite of the good work which has been done under the management of Mr. Curtis. A number of very well written works have been published, and a very intelligent zeal has been displayed in the furtherance of the export trade in American manufactures and products. We understand that there is some disposition to destroy a good deal of the work done and kill any further efforts by withdrawing from the Bureau the necessary appropriations for the coming year. Manufacturers interested in the export trade will vigorously protest against such a course.

The consumption of wrought iron or steel pipe by manufacturers of agricultural implements is rapidly growing. Orders for such pipe cut to lengths have been an important feature of the business done in the Western pipe trade during the past few months. The reason for its use is obvious. Manufacturers of farm machinery are on the alert to secure lighter material wherever possible, without sacrificing strength. By the use of pipe in place of solid bars they are often enabled to strengthen a part, while at the same time they decrease its weight. In no class of machinery is greater progress being made in the introduction of improvements than in farm machinery, in which Americans continue to lead the rest of the world. Nor has the ingenuity of the American machine builder exhausted itself. Instead of claiming perfection, and resting quietly on what has been accomplished, every manufacturer is on the *qui vive* to introduce some improvement which will give him a little the start of his rivals.

The Hudson River Tunnel is liable to pass wholly into the control of the London contractors, who have attached the work to satisfy a claim of $26,550. A few men are kept at work pumping in air to keep out the water, but for months not a foot has been added to the tunnel, and it remains still 1000 feet short of completion, without counting the approaches, on which nothing has been done.

Southern Iron Freights.

A new tariff on pig iron went into effect March 28 on the Queen and Crescent Route, covering carload lots from Southern furnaces to points North, South and West. Points east of Pittsburgh are omitted, but will be covered in a separate tariff shortly to be issued to be known as "East Bound

Pig Iron Tariff." In the meantime the rates to points not covered by the new tariff remain unchanged. The rates between the principal points are given below:

From / To	Dayton and Rockwood, Tenn.	Chattanooga, Tenn.	Birmingham district.	Decatur, Florence and Sheffield, Ala.	Anniston district.
Akron, Ohio	$3.15	$3.35	$3.85	$3.60	$3.85
Allegheny, Pa	3.70	3.90	4.40	4.15	4 40
Alliance, Ohio	3.15	3.35	3.85	3 60	3.85
Anderson, Ind	2.80	3.00	3.25	3.00	3.25
Ashland, Ky	2.35	2.55	3.05	2.80	3.05
Ashland, Wis	5.85	6.05	6.30	6.05	6.30
Ashtabula, Ohio	3.25	3.45	3.95	3.70	3.95
Atchison, Kan	4.80	5.00	5.00	...	...
Beaver Falls, Pa	3 70	3.90	4.40	4.15	4 40
Bellefontaine, Ohio	2.70	2.90	3.40	3.15	3.40
Belleville, Ill	2.80	3.00	3.25	...	....
Bridgeport, Ohio	3.70	3.90	4.40	4.15	4.40
Buffalo, N. Y	3.70	3.90	4.40	4.15	4.40
Burlington, Iowa	3.65	3.85	4.10	...	....
Canal Dover, Ohio	3.15	3.35	3.85	3.60	3.85
Canton, Ohio	3.15	3.35	3.85	3.60	3.85
Charleston, W. Va	2.79	2.99	3.49	3.24	3.49
Chicago district	3.40	3.60	3.85	3.60	3.85
Cincinnati, Ohio	2.05	2.25	2.75	2 50	2.75
Cleveland, Ohio	3.15	3.35	3.85	3.60	3.85
Columbus, Ohio	2.65	2.85	3.35	3.10	3.35
Council Bluffs, Iowa	5.64	5.84	5.84	....	..
Covington, Ky	2.05	2.25	2.75	2.50	2.75
Crawfordsville, Ind	2.95	3.15	3.40	3.15	3.40
Davenport, Iowa	3.65	3.85	4.10	....	....
Decatur, Ill	3.15	3.35	3.60	3.35	3.60
Defiance, Ohio	2.95	3.15	3.65	3.40	3.65
Des Moines, Iowa	5.13	5.33	5.58	....	..
Detroit, Mich	3.40	3.60	3.85	3.60	3 85
Dubuque, Iowa	3.80	4.00	4.25	4.00	4 25
Duluth, Minn	4.94	5.14	5.39	5.14	5.39
East St. Louis, Ill	2.80	3.00	3.25	...	...
Evansville, Ind	2.30	2.50	2.75	...	....
Findlay, Ohio	2.95	3.15	3.65	3.40	3.65
Fort Wayne, Ind	3.05	3.25	3.50	3.25	3.50
Frankfort, Ky	2.15	2.25	2.75	2.50	2.75
Girard, Ohio	3.25	3.45	3.95	3.70	3.95
Grand Rapids, Mich	3.65	3.85	4.10	3.85	4.10
Hamilton, Ohio	2.25	2 50	3.00	2.75	3.00
Hamilton, Ont	3.90	4.10	4.60	4.35	4.60
Houghton, Mich	6.20	6.40	6.65	6.40	6.65
Indianapolis, Ind	2.65	2.85	3.10	2.85	3 10
Ironton, Ohio	2.76	2.96	3 46	3.21	3.46
Johnstown, Pa	4.00	4.20	4.70	4.45	4.70
Joliet, Ill	3.40	3.60	3.85	3.60	3.85
Joplin, Mo	5.00	5.00	5.00	....	....
Kalamazoo, Mich	3.50	3.70	3.95	3.70	3 95
Kansas City, Mo	4.80	5 00	5.00	....	....
Kenton, Ohio	2.75	2.95	3.45	3.20	3.45
Lancaster, Ohio	2.75	2.95	3.45	3.20	3.45
La Salle, Ill	3.40	3.60	3.85	3.60	3.85
Lexington, Ky	2.05	2 25	2.75	2.50	2.75
Little Rock, Ark	3.50	3.50	3.50	....	....
Louisville, Ky	2.05	2.25	2.50	2 25	2.50
Madison, Wis	3.95	4.15	4.40	....	....
Mansfield, Ohio	2.95	3.15	3.65	3.40	3.65
Martin's Ferry, Ohio	3.70	3.90	4.40	4.15	4.40
Meadville, Pa	3.70	3.90	4.40	4.15	4.40
Memphis, Tenn	2.00	2.00	2 00	...	...
Milwaukee, Wis. (rail and water)	3.55	3.75	4.00	3 75	4.00
Milwaukee, Wis. (all rail)	3.80	4.00	4 25	4.00	4.25
Minneapolis, Minn.	4.94	5.14	5.39	5.14	5.39
Moline, Ill	3 65	3.85	4.10	3.85	4.10
Montreal, Ont	5.45	5.65	6.15	5.90	6.15
Muncie, Ind	2.65	2.85	3.10	2.85	3.10
Muskegon, Mich	3.65	3.85	4 10	3.85	4.10
New Albany, Ind	2.30	2.50	2.75	2.50	2.75
New Castle, Pa	3.25	3.45	3.95	3.70	3.95
Niles, Ohio	3.25	3.45	3.95	3.70	3.95
Oil City, Pa	3.70	3.90	4.40	4.15	4.40
Ottawa, Ont	5.45	5.65	6.15	5.90	6.15
Ottumwa, Iowa	4.62	4 82	5.07	....	..
Parkersburg, W. Va	2.95	3.15	3.65	3.40	3.65
Peoria, Ill	3.30	3.50	3.75	3.50	3.75
Piqua, Ohio	2.60	2.80	3.30	3.05	3.30
Pittsburgh district	3.70	3.90	4.40	4.15	4.40
Pittsburgh, Kan	5.00	5.5	5.00	....	....
Portsmouth, Ohio	2.80	3.00	3.50	3.25	3.50
Pueblo, Col	8.53	8.53	8.53	....	....
Racine, Wis	3.80	4.00	4.25	4.00	4.25
St. Cloud, Minn	7.28	7.48	7.73	...	...
St. Joseph, Mo	4.80	5.00	5.00	....	....
St. Louis, Mo	2.80	3.00	3.25	....	....
Salem, Ohio	8.40	3.60	4.10	3.85	4.10
Salt Lake City, Utah	16.93	16.93	16 93	....	....
Sandusky, Ohio	2.95	3.15	3.65	3.40	3.65
Shelby, Ohio	2.95	3.15	3.65	3.40	3.65
Sioux Falls, S. Dak	6.90	7.10	7.35	....	....
Sioux City, Iowa	5.64	5.84	5.84	....	....
South Bend, Ind	3.40	3.60	3.85	3.60	3.85
Springfield Ill	3.50	3.50	3.75	3.50	3.75
Springfield, Mo	5.00	5.00	5.00	...	...
Springfield, Ohio	2.50	2.70	3.20	2.95	3.20
Sterling, Ill	3.65	3.85	4.10	....	....
Steubenville, Ohio	3.70	3.90	4.40	4.15	4.40
Terre Haute, Ind	2.70	2.90	3.15	2.90	3.15
Toledo, Ohio	2.95	3.15	3.65	3.40	3.65
Topeka, Kan	6.59	6.59	6.59	..	....
Toronto, Ont	3.90	4.10	4.60	4.35	4.60
Upper Sandusky, Ohio	2.95	3.15	3.65	3.40	3.65
Wabash, Ind	3.05	3.25	3.50	3.25	3.50
Warren, Ohio	3.25	3.45	3.95	3.70	3.95
West Superior, Wis	4.94	5.14	5.39	5.14	5 39
Wheeling (W. Va.) district	3.70	3.90	4.40	4.15	4.40
Woodstock, Ont	3.90	4.10	4.60	4.35	4.60
Youngstown, Ohio	3.25	3.45	3.95	3.70	3.95
Zanesville, Ohio	3.05	3.25	3.75	3.50	3.75

CORRESPONDENCE.

Open-Hearth Steel Castings.

To the Editor: In a recent issue of your paper there was a very interesting article on the above subject by J. A. Herrick, in which he speaks of *bona fide* steel castings. I am glad he has used that expression, because it enables us to differentiate between real and bogus steel castings.

A company that I know of melt a mixture of cast iron and steel scrap in a cupola, and pour with the metal what they sell for Bessemer-steel castings. A piece of a broken "steel" knuckle, picked up on a railroad track, was found to contain carbon, 1.96 per cent.; silicon, 0.41 per cent.; manganese, a trace. Does any one wonder that it broke? Can we expect people to use steel castings when they get such hard, brittle material as that knuckle must be composed of? Undoubtedly there are places where castings of such metal will give satisfaction, but as a substitute for soft steel castings they must be a failure. Steel castings have sins enough of their own without being made to bear those of such metal as this.

All steel castings are made by one of three processes, viz., the open hearth, the Bessemer or the crucible, or some modification of one of these processes. Castings made by any process other than one of these are not made of steel. It would be well for users of steel castings to specify whenever possible either the chemical composition or the physical tests desired in the castings.

Mr. Herrick's statement that "cold metal means poor castings" is one of the most important facts to be taken into account in designing for the production of open-hearth steel castings. Cold metal means rough castings, blow holes, unaccountable shrinkages where apparently the casting should be perfectly solid, a leaky plug in the ladle while pouring, and, last of all, the possibility of having the nozzle become entirely stopped up with chilled steel before all the metal has been run out of the ladle. Hot metal means smooth, solid castings, but little drip from the nozzle and the certainty of pouring all the metal out of the ladle.

Mr. Herrick again says: "One difficulty experienced by most parties on first experimenting with the open-hearth system is the apparent undue amount of shrinkage of the metal in the molds. This can practically be overcome by proper precautions in making the melt and in handling the molds." I am aware that there is great variation in the shrinkage of steel, both in passing from the fluid to the solid state and after it has reached the solid state. So far I have been unable to control this matter, but am glad to hear the problem has been solved, and hope Mr. Herrick will shortly favor us with a description of his method.

I must take issue with Mr. Herrick on the subject of annealing soft castings. It is my belief that all steel castings are very much improved by annealing. An unannealed soft-steel casting will show a good tensile strength and a good stretch in a test bar, but will break under shock with surprising ease. Anneal the same casting. The tensile strength will not change much, the stretch will increase considerably, and its power of resisting shock will be vastly greater. An unannealed soft-steel casting may be compared to a piece of molasses candy, which is at the same time both ductile and brittle. Annealed, it loses its brittleness and becomes more ductile.

H. L. GANTT, M.E.

PHILADELPHIA, PA.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., April 5, 1892.

The practical defeat of silver legislation in the House has concentrated the attention of the campaign managers upon the Tariff as an issue in the contest for executive control. The free silver men, although worsted in their efforts of a couple of weeks ago, are not willing to concede permanent defeat but, as Speaker Crisp has notified them unless they present a petition signed by a majority of the Democrats of the House, he will not favor reporting a cloture rule to enable them to take up the Bland bill and have a direct vote upon it without the obstructive methods used by the opposition, they can only make a move in the way laid down by the Speaker.

In the Senate Mr. Morgan has made a move which will force both sides to take a position. The silver question is now simply one of party politics, and on the part of some there is lively dodging. The nomination of Harrison and Cleveland would force the silver men to make a nomination of their own or abandon the field. They threaten now that they will call a convention after the regular gatherings if both the candidates are anti-silver. In this movement they object to be supported by the Alliance organization. A Republican anti-silver protection, a Democratic anti-silver tariff revision and a free-coinage Alliance candidate in the field will make an interesting shake up of the political forces In Alabama, Texas, Mississippi and Georgia, and possibly Kansas and Nebraska, may win. In Nevada, Colorado, Montana and the Dakotas they are reasonably certain of success. In the two Virginias and Tennessee the Republicans expect to win on a divided Democratic vote.

The other States are expected to stand within their usual party lines, with Harrison carrying Indiana and with more than a fighting chance in New York, the dissensions there being more bitter than in 1888.

The chief issue of the contest will be Republican protection and Democratic tariff revision.

The Free Wool bill will have been disposed of in the usual course of parliamentary procedure, to-day or to-morrow. It is then proposed to go on with the other tentative bills, free binding twine and free cotton ties.

The canvasses of the House indicate that both parties will stand in line in the votes. The issue on tariff revision will be chiefly in the line of free raw materials, which, it is claimed, is particularly popular in New England.

Since the retreat of Lord Salisbury and the agreement to a *modus vivendi*, the belligerent aspect of business in the War and Navy departments has relaxed. The result, however, has been the creation of a strong sentiment in Congress in favor of big appropriations for more big ships and increased sums for high-power guns and the latest improvements in offensive and defensive appliances for land and water service. The torpedo system will receive the most active attention in connection with coast defenses.

Millard A. Smith, the chief of the Department of Transportation Exhibits of the World's Columbian Exposition, desires to notify all intending exhibitors of railway materials, machinery and appliances that application for space should be made as soon as possible. Applications already received in the railway division call for over 200,000 square feet of space net. Foreign governments have asked for and

been granted 73,000 square feet for railway, marine and vehicle exhibits. This includes Great Britain, 25,000 feet; Germany, 20,000 feet; Canada, 15,000 feet; Austria, 10,000 feet; Mexico, 3000 feet, France, Belgium, Russia and other countries will want space, but have not yet formulated their requirements. Among the specialties which will form an interesting and important feature of the department will be very large exhibits of conveying and freight handling systems of machinery. The leading railway systems of the country will make large and expensive exhibits. The historical features will be numerous and instructive. Manufacturers generally have been prompt and enterprising in making applications for space. There are still, however, some hundreds whose delay is likely to cause themselves some disappointment.

PERSONAL.

Some important changes among the officials of the Carnegie interests of Pittsburgh have taken place and others will be made with the next three months. William L. Abbott, for some years chairman of Carnegie, Phipps & Co., Limited, has retired as chairman, but still retains large interests in the firm. The reasons advanced by Mr. Abbott for taking this step are that he desires to be relieved from the cares and responsibilities which his important position naturally enforced upon him. Mr. Abbott entered the employ of the Carnegie interests just 21 years ago, and has been advanced step by step until he was finally tendered and accepted the position of chairman of Carnegie, Phipps & Co., Limited, upon the retirement of John Walker some years since. Mr. Abbott has acquired a handsome competency and, as stated above, retires in order that he may be in a position to enjoy the fruits of his very successful business career. The step taken by Mr. Abbott will, of course, necessitate some other changes in the Carnegie associations. The principal one of these will be a consolidation of the interests of Carnegie, Phipps & Co., Limited, and Carnegie Brothers & Co., Limited, into one organization, as both concerns are controlled by the same interests. Steps in this direction are now being taken, and the consolidation will become effective on July 1 next. A new title will be adopted for the new concern, and H. C. Frick, now chairman of Carnegie Brothers & Co., Limited, will be chairman, thus insuring perfect unity of management.

A. C. Milliken, general manager of the Pottsville Iron and Steel Company, Pottsville, Pa., has resigned. He will soon make a trip to Europe.

The Calumet Furnace of the Chicago Furnace Company was blown out on the 30th ult. to await a more favorable condition of the Iron market. The lining was found to be in excellent shape, good for another blast. Repairs will be made to the stoves, and the machinery will be also put in good order, so as to be ready to blow in again when trade improves. The Chicago Furnace Company are still in the market as sellers of Pig Iron, having a considerable stock on hand. The daily output of local Coke Iron will be materially reduced by the withdrawal of this furnace from the list of active works.

The offices of the Pittsburgh Testing Laboratory, Hunt & Clapp, inspecting and metallurgical engineers and chemists, have been removed from Schmidt Building, Pittsburgh, Pa., to No. 116 Water street, in that city.

NEW PUBLICATIONS.

A GUIDE TO ELECTRIC LIGHTING. By S. R. Bottone. Published by Macmillan & Co., New York; illustrated; 12 mo; 189 pages; price, 75 cents.

The author first deals with the various kinds of primary batteries, which is followed by a description of the mode in which the battery works, so as to enable the reader "to form an idea of the relative adaptability of the different forms for the particular purposes to which they may be applied." Now follows a description of different forms of dynamos and the best known arc and incandescent lamps and the methods of wiring. The chapter on accumulators contains a description of a very effective one that can easily be made by any amateur. The fifth chapter considers the smaller appliances which are necessary in any electric lighting system. The final pages are devoted to the electric motor and a discussion of the cost of power obtained from the motor. The book is well written, free from technicalities, and deals with the subject in an original and instructive way.

THE STANDARD GUIDE TO CHICAGO, for the year 1892. Written and compiled by John J. Flinn. 16mo, 632 pages; scarlet cloth or flexible morocco. Published by the Standard Guide Company, 358 Dearborn street, Chicago; price, $1 cloth or $2 morocco.

This volume is not merely an advertising scheme, giving fulsome notices of retail merchants, as is so often the case with publications professing to be guides. It is, on the contrary, a very complete presentation of the industrial, commercial and other business interests of Chicago, including all the special features which may be found worthy of note by a visitor. It describes all of Chicago's attractions and omits none of the great features which have made the city world-renowned. Over 70 engravings are given, covering the most important buildings, street scenes, park views, &c. A map of the city, very comprehensive in detail but remarkably clear, accompanies the work. An index, covering 18 pages, and very cleverly arranged, so as to enable anything sought to be easily found, is not the least point of excellence about the volume. The people of Chicago will appreciate this guide as well as strangers, because the information contained in it is of such a character that no one could hope to acquire it except at a vast expenditure of time and labor.

MANUAL OF AMERICAN WATER WORKS. M. N Baker, editor. Published by Engineering News Publishing Company, New York. Octavo; 384 pages; price, $3.

For several years this book has been the standard publication concerning the water works of the United States and Canada. Since its inception unusual care has been exercised in the collection and preparation of the matter composing it, the natural result being that it is now the authority on the subject. The present volume describes all the waterworks known to be in operation or under construction July 1, 1891, and in addition contains brief descriptions of such projects as bid fair to develop into works. The book is divided into ten parts, the United States forming eight of these and Canada the rest, under each part or group the towns having water works being arranged in alphabetical order. Under each town is given in brief the history of the works, the supply, machinery, capacity, distribution, financial statement and list of the managing officers. A glance at any page of the book cannot fail to convince the reader of its true worth as an accurate guide to the water supply of the cities of the country.

MANUFACTURING.

Iron and Steel.

Reports were circulated in Pittsburgh last week to the effect that Carnegie, Phipps, & Co., Limited, of that city, had purchased outright the plant of the Bethlehem Iron Company at Bethlehem, Pa. The report had been emphatically denied at the office of the Pittsburgh firm in question.

The Bostwick Fire Proof Steel Lath Company of Wheeling, W. Va., have recently established selling agencies for their goods in a number of Southern cities.

A meeting of the stockholders of the Columbia Iron and Steel Company of Uniontown, Pa., was held in that place on Tuesday afternoon, the 29th ult., to vote on the proposition of increasing the indebtedness of the company. The plan was to issue bonds secured by second mortgage on the plant in the sum of $500,000. The first mortgage is for $150,000. The vote was unanimous to issue the bonds, and the directors were authorized to put them on the market at once. With a little over $300,000 of the new fund the floating debt of the company is to be paid at once. All of the other creditors have agreed to let the five-year extension go and take bonds for the amount. The remaining portion of the $500,000 is to be used as a working capital. This done, the management expects to get the mill to going again with more regularity and profit to the stockholders than it has yet been. This will make the entire debt $650,000, a little more than the cost of the plant.

At a meeting of the stockholders of the Sterling Steel Company of Pittsburgh, whose works are located at Demmler, Pa., held in the Westinghouse Building, Pittsburgh, on Thursday, the 31st ult., it was decided to increase their capital stock from $250,000 to $350,000. The firm have recently made some extensive improvements and additions to their plant, and the extension of the capital stock was for the purpose of paying for these improvements. The new steel projectiles recently tested by the Government, and made by this firm, will be made in the new departments added. The new additions include a hammer shop 56 x 56 feet, a machine shop 60 x 150 feet, in which will be placed 40 lathes. There has also been added a new 4-ton hammer and improved and enlarged melting capacity. The plant will have a daily capacity of 20 6-inch steel projectiles.

After an idleness of two months, the wash metal plant of the Youngstown Steel Company at Youngstown, Ohio, resumed operations last week.

The project of conveying molten metal from the blast furnaces of Carnegie Bros. & Co., Limited, at Braddock, Pa., across the Monongahela River to the Homestead Steel Works of Carnegie, Phipps & Co., Limited, at Homestead, Pa., was tried last week with considerable success. The transfer was made by attaching three 10-ton hot-metal cars to a yard engine, the route taken being the Pennsylvania Railroad to Brushton, thence over the Pittsburgh, Virginia and Charleston Railroad bridge to Port Perry, and then to Homestead. Colonel Cosgrove and other superintendents interested were on the train, and they pronounced the transfer of the hot metal a complete success.

The stockholders of the Reading Rolling Mill Company met at the office, 257 South Fourth street, Philadelphia, on March 23, and elected four new directors, as follows: G. W. Bush, William Nolan, C. A. Sterling and D. R. Cofrode. The other members of the board are Joseph H. Cofrode, Francis H. Saylor and J. T. Bailey.

No. 4 open-hearth melting furnace at Phœnix Iron Company's Works, Phœnixville, has beaten all previous records, as far as known, having made 18 heats of under 0.14 carbon soft steel in six days, using 33 per cent. pig. No. 4 is a 20-ton furnace, and the total tonnage of ingots in the six days was 389 tons of 2240 pounds. We believe this has never been equaled with producer gas and light scrap. It reflects the highest credit on furnace department work.

The Southern Malleable Iron Company is now running at full capacity, but will close down in about 30 days for the dull season.

The Ross-Meehan Brake-Shoe Foundry Company will soon begin operating their plant to its full capacity again. Their dull season usually extends through February and March, and the officers of the company state that they now look for an increased volume of business.

Three furnaces are now at work at the plant of the Pennsylvania Steel Company, Steelton, Pa., and the fourth will go in blast some time this month. No. 1 is making 20 per cent. spiegel, while Nos. 2 and 4 are running on iron.

The latter made the largest run in her history during March, averaging 200 tons per day, and producing in a single day 253 tons. This was made on a mixture of ⅞ Cuban ore and hard ore, carrying 0.5 per cent. sulphur, on less than a ton of fuel. Considering the size of the furnace, 70 x 19 feet, this is a performance of which Furnace Superintendent G. F. Knapp has reason to feel proud.

A report is in circulation that the Tennessee Coal, Iron and Railway Company will erect an iron furnace at Clinton, Tenn., in the near future.

The representatives of two Pennsylvania furnaces were at Big Stone Gap, Va., last week with a view to locating two more blast furnaces at that point. Arrangements are now in progress looking to that end.

The Dora Furnace, at Pulaski, Va., is completed and already has on hand 700 tons of iron ore and a large amount of limestone stored in the stockhouse, and it is stated that within three weeks the furnace will be in operation.

One of the furnaces of the Appalachian Steel and Iron Company at Big Stone Gap, Va., will go into blast about April 10 and the other will be ready for operation soon after.

Boston parties have purchased or leased a large body of the Starr Mountain iron land on the Knoxville Southern Road, near Knoxville, Tenn., and it is reported will build a rolling mill at Knoxville and develop their iron property on an extensive scale.

No. 1 furnace of the Stewart Iron Company, Limited, Sharon, Pa., went out of blast on the 25th ult. Both stacks are now idle.

Norristown Furnace, Isaac McHose & Sons, Norristown, Pa , was blown out on the 28th ult. for repairs. The furnace had been in continuous blast for 137 weeks.

The new Philadelphia Furnace at Florence, Ala., has begun to market its iron.

The Corning Steel Company of 418-420 Phenix Building, Chicago, are erecting an extensive plant at Peoria, Ill., for the manufacture of sheet iron and steel. While a number of small changes will be made, there will be no great or radical departure from modern practice as followed in the best sheet mills of to-day. The plant will be in running order late in the summer, and will have a capacity of about 80 tons of finished sheets per 24 hours, based on No. 27 gauge.

The office of M. V. Smith, consulting mechanical engineer, has been removed from Room 802, Hamilton Building, Pittsburgh, Pa., to Room 607, Times Building, in that city.

The offices of Julian Kennedy, consulting and contracting engineer, and the branch office of the Latrobe Steel Works, Latrobe, Pa., have been removed from the Hamilton Building, Pittsburgh, Pa., to Rooms 36 to 39, Ferguson Building, in that city.

The Reading Iron Company of Reading, Pa., have notified their employees of a reduction in wages to take effect during this month. It averages from 5 to 10 per cent.

Wages for the quarter beginning April 1 at the Homestead Steel Works of Carnegie, Phipps & Co., Limited, at Homestead, Pa., were arranged last week. No change was made, wages for the next quarter being based on $25 for 4 x 4 inch billets, below which price wages cannot be reduced. The sliding scale at Homestead will expire on July 1 next, after being in operation three years. Several conferences have recently been held between the firm and their employees looking to the formulating of a new scale, but as yet nothing definite has been done. In all probability a scale very similar to the one now in force will be decided upon.

The Lalance & Grosjean Mfg. Company of New York, manufacturers of hollow ware, have decided to erect a plant at Harrisburg, Pa., and the work of construction will begin at once. Twelve acres of ground have been purchased at a low cost, through the efforts of the Board of Trade of Harrisburg. The company will erect three rolling mills and a blooming mill at an estimated cost of $185,000, and will employ 200 men. This move is simply for the purpose of increasing the capacity and to be near raw material for the manufacture of their own Bessemer steel sheets, which the company now import. The present large plant at Jamaica, L.I , will not be affected.

Machinery.

The Standard Scale and Supply Company have been organized at Bellefonte, Pa. They are composed of William Burnside and Frank Gill of Pittsburgh and Harry Valentine of Bellefonte, Pa. The works will be located in Bellefonte, while the general office will be at Pittsburgh.

The Union Foundry and Machine Company of Pittsburgh have decided to engage in the manufacture of tin plate machinery. At present they are building a part of the machinery to be used in the new plant of the Blairsville Rolling Mill and Tin Plate Company, now being erected at Blairsville, Pa. It consists of a two-roll long sheet tinning pot, a five-roll improved Morewood pot and a pickling machine.

The Lloyd Booth Company, proprietors of the Falcon Foundry and Machine Works, at Youngstown, Ohio, have purchased the plant of the Ætna Machine Company at Warren, Ohio. It is the intention of the firm to put the plant in operation as soon as possible, making a specialty of the manufacture of all kinds of tin-plate machinery and supplies. This firm have recently finished building several Morewood tinning sets for the American Tin Plate Company, at Elwood, Ind., and are now working on an order for this class of machinery received from the U. S. Iron and Tin Plate Mfg. Company of Demmler, Pa. C. H. Booth, president of the Lloyd Booth Company, is now in California on a pleasure trip, and recently paid a visit to the Temescal tin mines in that State. This has given rise to a report that Mr. Booth would erect a large tin-plate plant in Youngstown upon his return. We are advised that there is no truth in the report whatever.

The Chicago Foundry Supply Company, Eighteenth and Rockwell streets, Chicago, increased their capital stock to $75,000 at a special meeting of the stockholders on the 28th ult. The additional capital was needed for the enlargement of the plant and the purchase of new and improved machinery to meet the heavy demand for the company's goods, such as foundry facings, supplies and foundry equipments. The company have just issued a price-list of wrought-iron chaplets and chaplet stems, made either with forged heads or with square plates fitted ; also double head chaplet stems, double head chaplets with forged heads and double head chaplet stems with square plates fitted. Special size chaplets are made to order.

Warren Webster & Co. of Philadelphia have just received a duplicate order for a 1500 horse-power steam economizer for the National Tube Works, McKeesport, Pa. Also one of the same power from the Annheuser-Busch Brewing Company of St. Louis, Mo., and two of 500 horse-power for the Apollo Iron and Steel Company. Advices from Antwerp are also exceedingly satisfactory, seven orders having been received at that agency within a few days, from parties in France, Belgium and Germany, with several others under negotiation.

The Mahoning Foundry and Machine Company of Danville, Pa., have just received an order to duplicate the steel crane built last fall for one of the quarries in Barre, Vt. The mast is to be 90 feet high and the boom 65 feet long, the power-turning device being the patent of Milliken Bros. It is said that with this crane two men can easily do the work of 25.

The Rome Mfg. Company, which was recently incorporated at Rome, Ga., with a capital of $15,000, will at once erect a plant for manufacturing tea kettles and boilers.

Carter & Co. of Summertown, Tenn., will erect a foundry and machine shop at Ethridge, Tenn.

S. K. Allen & Sons will erect a foundry, machine and repair shop at Humboldt, Tenn.

The erection of a big brass foundry for the Worthington Pump Company of South Brooklyn has been commenced at Elizabethport, N. J. The foundry is to be finished by the fall and will furnish employment to 300 men. It is expected that in a few years the greater portion of the immense plant of the Worthington Company at South Brooklyn will be transferred to Elizabethport.

Gifford Brothers, founders and machinists, at Hudson, N. Y., have extended their facilities in all departments

The Rider Engine Works, Walden, N. Y., have commenced work on the new building to be erected for use in connection with the plant.

Goddard Bros.' foundry and blacksmith shop at Tremont, Wash., has been destroyed by fire at a loss of $3500.

The Providence Chain Works, owned by Wm. Woodhouse & Sons, Providence, R. I., have increased their capacity by the erection of an addition 95 x 35 feet.

The Hendrick Mfg. Company, Carbondale, Pa., manufacturers of refrigerating and ice making machines, filter and hydraulic presses, perforated sheet metals, mining machinery, &c., have just completed a one-story brick plate shop 150 feet long and 42 feet wide. Ground has been broken for a new power house 50 feet long, 30 feet wide and a brick blacksmith shop and pipe coiling shop 90 feet long and 42 feet wide. They have recently added a set of 8-foot Niles plate-bending rolls, a 6-foot Hilles & Jones squaring and trimming shear, a 3-foot Hilles & Jones throat punch, a 20-inch Bridgeport screw machine, a 60-inch Hilles & Jones plate-straightening rolls and a new equipment of Prentice drills.

Manning, Maxwell & Moore have just been awarded by the Midvale Steel Company of Philadelphia a contract for one 80-ton and one 20-ton Shaw electrical traveling crane.

The New Castle Car Mfg. Company of New Castle, Pa., have been granted a charter of incorporation, with a capital stock of $25,000.

The foundry, pattern works and machine shops of Hugh M. Bole, at Pittsburgh, have been damaged by fire to the extent of $20.000. The plant had been idle for some time.

The Chattanooga Foundry and Pipe Works, Chattanooga, Tenn., have suspended operations pending an improvement in the trade.

An addition, 170 x 51 feet, is being added to the machine shop of the Pusey & Jones Company of Wilmington, Del. A 15-ton traveling crane and a 10-ton swing jib crane will be among the new equipment.

The new foundry of the Atherton Machine Company of Lowell, Mass., has been completed, and ranks among the best of modern establishments.

Miscellaneous.

The Q. and C. Company, Phenix Building, Chicago, successors to the Dunham Mfg. Company, have secured a favorable location in Chicago and will shortly transplant their manufacturing operations entirely to that city. They control a number of railroad specialties which have commended themselves strongly to the favor of the leading lines of the country, resulting in a steadily increasing business. The removal of their works to Chicago is in accordance with the general tendency toward concentration of railroad supply manufacturers in the vicinity of the head of Lake Michigan.

Among recently authorized corporations in Illinois are the following : Eclipse Tool Company, Chicago; capital stock, $30,000; incorporators, Albert Billingslea, J. Leroy, Francis and William E. Gooding. Tremont Mfg. Company, Elgin ; metal goods ; capital stock, $5000 ; incorporators, Frederick J. Mosedale, J. B. Horne and others. The Illinois Nail Company, Chicago ; capital stock, $50,000 ; incorporators, James P. Sherlock, T. G. Windes and Henry M. Stoltenberg. The Columbia Grill Company, Chicago ; to manufacture grills, fire screens, &c.; capital stock, $10,000 ; incorporators, Charles F. Gilbert, W. E. Craig and Vada F. Gilbert. Western Temperature Regulation Company, Chicago ; to handle a patent for the regulation of the temperature ; capital stock, $60,000 ; incorporators, Charles A. Barker, R. S. Hudson and Arthur A. Simons. The Streator Rolling Mill Company, Streator ; capital stock, $25,000 ; incorporators, J. D. McVean, O. B. Ryon and E. Bacon. The Chicago Copper Mfg. Company, Chicago ; capital stock, $20,000 ; incorporators, A. W. Bulkley, C. E. More and S. H. Strawn. The Murphysboro Car Works, Murphysboro ; to build railroad cars ; capital stock, $150,000 ; incorporators, T. M. Logan, W. R. Jones and others. The Applegate Incandescent Lamp Mfg. Company, Chicago; capital stock, $500,000 : incorporators, Engene W. Applegate, William J. Lloyd and E. A. Nichols. The Orvis Bros. Down-Draft Furnace Company, Chicago ; to manufacture smoke-consuming furnaces ; capital stock, $50,000 ; incorporators, O. D. Orvis, Orel D. Orvis and W. E. Timmerman. The Columbia Neck-Yoke Center Mfg. Company, Chicago ; capital stock, $10,000 ; incorporators, W. F. Munson, Samuel Ehrlich and Moses J. Ehrlich. The George Bryant Mfg. Company, Chicago ; metallic goods ; capital stock, $5000; incorporators, Sigmund Birkenstein, G. Bryant and L. Birkenstein. The Lake Michigan Navigation and Ship-Building Company, Chicago ; capital stock, $150,000 ; incorporators, Richard Mahn, I. G. Gianer and others. North American Lamp Company, Chicago ; to manufacture lamps, electrical machinery, &c.; capital stock, $2.500,000 ; incorporators, Charles S. Burton, Jean Elliot and M. E. Moore.

The iron pipe business formerly conducted under the firm name of Clogstone & North, owing to the death of Mr. Clogstone of Fair Haven, Vt., will be continued by Mr. North at West Rutland, Vt. This company make a specialty of putting in heavy sheet-iron water pipes for mills and factories. They are very busy.

The offices of the Pittsburgh Reduction Company have been removed from Room 59, 95 Fifth avenue, Pittsburgh, Pa., to 116 Water street, in that city, where a storeroom of aluminum—sheet, wire and ingots—will hereafter be kept. All correspondence should be sent to the above address, while all supplies for the works should be sent to New Kensington, Pa.

The Jones Vestibule Sleeping Car Company have been organized in Denver, Col., with a capital of $3,000,000, to manufacture a car patented by H. M. Jones. The invention is said to be an improvement on any form of car now in use.

The Huntingdon Car Works of Huntingdon, Pa., have renewed operations, after an idleness of more than a year.

The New Castle Car Mfg. Company of Lawrence County, Pa., capitalized at $25,000, have been chartered.

The Harris Car Company, who have been seeking a location for their works for some time, have entered into arrangements with the Chesterfield Heights Land Company of Petersburg, Va., whereby the former company agree to establish works at that place if capital stock of the company to the amount of $100,000 is subscribed for.

The Ensign Mfg. Company, at Huntingdon, W. Va., have recently received several large orders for cars, among them being one from the Louisville and Nashville Railroad for 250 fruit cars, one from the Missouri Pacific Railroad for 500 patent Canada cattle cars, and one from the Chesapeake and Ohio Railroad for 200 30-feet double hopper bottom coal cars, to be equipped with all the last improved patented appliances for the convenience and safety of employees handling them. They will have the Janney couplers, Westinghouse air brakes, and other modern improvements.

The Spring Garden Pumping Engine.

The Southwark Foundry and Machine Company of Philadelphia have just completed the large pumping engine for the Spring Garden Water Works. It is of the twin compound condensing quarter-crank and fly-wheel high-duty type, and will have a capacity of 20,000,000 gallons per 24 hours, delivered against a head of 250 feet above the water in the forebay, through a rising main of 48 inches diameter and about 14,000 feet in length. It has two high pressure steam cylinders, each 3 feet 8 inches in diameter, and two low-pressure steam cylinders, each 7 feet 4 inches in diameter. The pump plungers are two in number, each 37 inches in diameter, and are of the double-acting outside-packed pattern. In connection with the pumping engine there will be employed two jet condensers, with single-acting air pumps.

The steam cylinders are of large proportions, owing to the great static head under which the pump has to work, and are placed vertically to reduce to a minimum the possible wear due to the dimensions of the working parts, and at the same time to eliminate as far as possible the frictional resistance of the engine. The water cylinders are placed in a horizontal position, the valves working in a vertical direction. The steam and water cylinders are firmly bolted to massive bed plates provided for them, which bed plates also carry the bearings for the beam shaft, crank shaft fly wheel and steam cylinders, thereby making a complete support for the entire structure independent of the foundation.

A triangular walking beam is employed for transmitting the power to the pump, and a fly wheel, 20 feet in diameter, is located on the main shaft. The steam-admission valves are automatically controlled by the Porter governor, manufactured exclusively by the Southwark Company, which insures great economy in steam consumption and a uniform speed under varying water pressures.

The entire pump weighs nearly 1,000,000 pounds. The fly wheel weighs from 90,000 to 100,000 pounds, and the bed plate nearly 80,000 pounds. The pump will occupy 40 x 30 feet floor space, and is 35 feet high. It was put together complete at the company's works, and is now being taken apart to be removed to its destination.

TRADE REPORT.

The reports from the blast furnaces are unfortunately not sufficiently complete so early in the month to present a complete statement. Some data are available, however, to indicate a decided tendency toward a reduction in the output. Seventy-three Anthracite furnaces which were active on March 1 had a capacity of 33,003 gross tons, based on February product, out of a total of 38,678 gross tons for 89 furnaces last month. Of these 68 are still running, and one additional furnace has blown in, making the capacity at work on April 1 31,176 gross tons, a decline of nearly 2000 tons per week for the Anthracite furnaces, in spite of the fact that quite a number of the active plants, notably in the Lehigh Valley, made an exceptional record in March. The Anthracite furnaces which have been stopped are Secaucus, Mt. Laurel, Norristown, one Bethlehem, Lehigh, Paxton and one Colebrook, while one Thomas has started.

The following Coke furnaces banked or blew out in March: Mohawk, in New York, one Edgar Thomson, Alice, Douglas, Stewart and Everett in Western Pennsylvania, Anna in the Mahoning Valley, the Calumet, at Chicago, and Crozer in Virginia, these representing a weekly output of 7143 gross tons. Others may not have been reported as yet. Against this Philadelphia, in Alabama, and Embreeville, in Tennessee, have made their first cast, representing a capacity in the aggegate of about 1400 tons, to which Dora and Big Stone Gap, in Virginia, will be added this month This would indicate a restriction of about 5700 tons weekly for the Coke furnaces. This may possibly be reduced somewhat if it should appear that the furnaces in blast are doing particularly good work. In some plants the stoppage of one furnace makes it possible to run the others faster by utilizing the full blowing machinery.

As it is, the reduction of output with the Anthracite and Coke furnaces seems to amount to about 7500 tons per week, which, at the rate at which Iron was piling up so far this year, does not yet meet the case. It is, however, an encouraging sign that the enormous output is being checked somewhat.

In all the leading markets Pig Iron is reported to be dull, but fairly steady, with some indications of more inquiry in some quarters. Some large sellers appear satisfied for the present with the quantity sold for long delivery and have practically withdrawn. It is a question who will first re-enter the market, the buyer or the seller, so that it may be a waiting market for some time to come. Bessemer Pig at Pittsburgh is dull at $14.50.

In Steel Billets, both in the East and in the West, the heavy business done during the past two months has been followed by a lull. The mills, being well supplied with orders, are holding at $23, Pittsburgh and Wheeling, while buyers take little interest in the market, in which there are only a few stray orders.

There is some activity in Bars in Chicago, but Pittsburgh and Eastern Pennsylvania report a dull trade. The demand for Structural Material is reported to be improving in all the leading centers, but prices show no disposition toward recovery.

In the territory east of the Allegheny Mountains the Plate mills are continuing their struggle for work, nearly all of them having capacity partially unengaged. Instances are constantly cropping up of very low prices made when two or more concerns show unusual determination to capture an order. Sheets are in better demand.

As week after week passes without any signs of the long-expected increase in business, the discouragement among the Eastern Rail mills grows. It is idle to deny that the course of trade in this specialty has been particularly disappointing to makers.

The Copper market has relapsed into dullness, and the conviction is growing that the combination of producers has fallen to the ground. Tin has been advanced a trifle, and Spelter is firmer on advices of a stronger feeling in the West and the shipment of about 1500 tons for export. On good-sized lots of Coke Tins, for future delivery, concessions are of frequent occurence.

Chicago.

(*By Telegraph.*)

Office of *The Iron Age*, 59 Dearborn street,
CHICAGO, April 6, 1892.

The volume of business is large and steadily increasing. Inquiries are numerous for finished Iron and Steel, and even Pig Iron seems to be a little more active. Unusually heavy requisitions are being made by railroads covering all classes of material. Implement manufacturers are in the market for further supplies and jobbers have been stocking up again. Prices have been adversely affected by the increased demand and lower rates have prevailed than when business was quiet. Sellers seem to fear that the purchasing movement is only a spurt, and, therefore, they are eager to secure the orders in sight. The mills, however, are getting well supplied with work in some lines, and those which cover a wide territory are insisting on prompt reports of sales by all agents, to guard against overselling their capacity at these low rates. A few of them are attempting to establish a slight advance, but they find that transactions are then immediately checked.

Pig Iron.—The local producers of Coke Pig Iron are much firmer in their views, now that the output has been heavily curtailed. If the situation depended wholly on them there is no question that very low prices would be a matter of ancient history. The Southern furnace companies are, however, persistently seeking orders, and until they have changed their policy there can be no material improvement. Southern Coke is not weak on all grades, but No. 2 Foundry and No. 2 Soft seem to be especially heavy, and have been offered at concessions on our lowest quotations for spot cash. Consumers have been figuring on quite a large number of round lots of these grades, but the low prices do not always result in sales. They first wish to see some indication that bottom has been actually reached. Meanwhile the carload trade is growing

larger every week, showing that stocks at the foundries are running low. Pig Iron dealers who have been making a thorough study of the condition of trade in this locality believe that within the next 30 days many heavy consumers will be forced to purchase largely. Lake Superior Charcoal is still quiet, and our quotations are only nominal on that class of Iron, in the absence of business to fix values. Quotations as follows:

Lake Superior Charcoal	$17.00 @ $17.50
Local Coke Foundry, No. 1	14.75 @ 15.50
Local Coke Foundry, No. 2	14.00 @ 14.50
Local Coke Foundry, No. 3	13.50 @ 14.00
Local Scotch	15.00 @ 16.00
Ohio Strong Softeners	17.00 @ 17.75
Southern Coke, No. 1	15.50 @ 15.75
Southern Coke, No. 2	14.00 @ 14.50
Southern Coke, No. 3	13.25 @ 13.75
Southern, No. 1, Soft	14.00 @ 14.50
Southern, No. 2, Soft	13.25 @ 13.75
Southern Gray Forge	13.25 @ 13.50
Southern Mottled	13.00 @ 13.50
Tennessee Charcoal, No 1	17.50 @ 18.00
Alabama Car Wheel	21.00 @ 23.00
Coke Bessemer	16.00 @ 16.50
Hocking Valley, No. 1	17.00 @ 18.00
Jackson County Silvery	17.25 @ 18.25

Spiegel.—Is moving in a limited way at old prices.

Bar Iron.—More transactions and inquiries have come to light within the past couple of weeks than for a long time previous. Jobbers have bought considerably for future delivery and more are in the market. Car orders have been placed by car builders in the interior of the State and manufacturers in other branches have bought quite liberally. Railroads are also making good requisitions. Yet prices continue weak, anything desirable being largely taken by some establishment evidently in need of business. Mills are advising their customers to anticipate their needs for the summer, arguing the great possibility of a shut down after the first of July to settle the wage question, which may be prolonged this year in view of the radical change in wages schedules necessary to be made. They expect May and June to be very busy months with all the mills. General mill specifications are quoted 1.60¢ @ 1.65¢, Chicago, half extras, with concessions for desirable orders. Soft Steel Bars are selling at 1.80¢ @ 1.85¢ from mill.

Structural Shapes.—A great deal of business is reported. The demand for building material is active, and at least one important building was placed under contract the past week. Bridge works are reported to be running light but they are steadily in the market for material. Quotations on mill shipments are as follows, Chicago delivery: Beams, 2.25¢ @ 2.50¢; Angles, 1.90¢ @ 2¢; Tees, 2.50¢ @ 2.60¢; Universal Plates, 1.90¢ @ 2¢; Sheared Plates, 1.95¢ @ 2¢.

Plates, Tubes, &c.—A more hopeful feeling is perceptible. Business is actually reported greater in volume now than at the corresponding time last year. Other sections are evidently not as well for business as this locality because the mills are making continued efforts to unload their surplus product here, very low prices are reported. Dealers quote from stock as follows: Tank Iron, 2 40¢ @ 2.50¢; Tank Steel, 2.30¢ @ 2 40¢; No. 10 to No. 14 Iron or Steel Sheets, 2.40¢ @ 2.50¢; Flange Steel, 2.90¢ @ 3¢; Shell Steel, 2.60¢ @ 2.75¢; Rivets, 4¢ @ 4.25¢; Boiler Tubes 3 inch and larger, 71 %; 2¼ inch and less, 55 % off; Tank Steel in mill shipments is quoted 2¢ @ 2.10¢.

Sheets.—Black Sheets have been in quite good demand recently, and No. 27 is quoted 2.85¢ @ 2.90¢ from mill. Galvanized is quiet and inclined to weakness, although mill shipments continue to be quoted 70 % off for Juniata.

Merchant Steel.—The month of March is reported by merchants to have been very satisfactory as to volume of business, the total sales showing handsome gains on the month preceding. Trade continues very fair. Machinery, Spring and Tire Steel are still quoted 2¢ @ 2.25¢ in carload lots, according to quality and finish, and Tool Steel 6¢ and upwards.

Track Supplies.—Quite an active inquiry has developed in light Steel Rails, but the demand for standard sections is rather quiet at present, although there is a great deal of tonnage in sight which is almost certain to be placed as the season advances. Quotations range from $31 upward, according to quantity. Iron and Steel Splice Bars are quoted at 1.80¢; Spikes at 2.15¢ @ 2.20¢, and Hexagon Nut Track Bolts 2.65¢ @ 2.75¢.

Old Rails and Wheels.—A sale of 500 tons Old Iron Rails is reported at $19, East St. Louis, but no business has transpired here. Dealers quote nominally $19.50, Chicago. Old Steel Rails have been in better demand with $14.50 quoted for short pieces. Old Car Wheels are quiet at $15.50 @ $16, according to quantity.

Scrap.—Wrought is still neglected; Cast is now rather quiet. Steel is in some demand from Pittsburgh. Quotations unchanged as follows: No. 1 Railroad, $17; No. 1 Forge, $16; No. 1 Mill, $11; Pipes, $11; Cast Borings, $7 @ $7.25; Wrought Turnings, $9.50 @ $9.75; Axle Turnings, $12; Heavy Cast, $11.50; Stove Plate, $9; Malleable Cast, $10; Mixed Steel, gross ton, $10.50 @ $11; Coil Steel, $15; Leaf Steel, $16.

Metals.—The Copper market is quiet here at steady prices. Carload lots of Lake continue to be quoted 12¼¢ @ 12½¢, and casting brands 11.75¢, with one car load of the latter sold at 11.85¢. A sale of 1000 tons of Spelter for export is reported at a very fair price. This has helped the market, which is now firm at 4.40¢ With regard to Pig Lead, the weekly circular of Henry R. Post says that it is again receiving attention from consumers and speculators at home and abroad, principally because of the many bull arguments as to production and consumption. A careful estimate of last year's trade shows almost 14,000 tons of Lead consumed by the underground cable companies, and the present year will probably show an increase. In other branches of trade where Iron Pipe has been used very largely Lead is being substituted. No channels are now visible that will show a corresponding increase in production. Sales of Desilverized have been made at 4.05¢ up to 300 tons; also some ten cars Missouri at 4.05¢. At the close 4.05¢ is bid and 4.07½¢ asked.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., April 5, 1892.

The third month of the year has been very trying to the Iron and Steel trades, and in several leading specialties prices have been the lowest on record. This was more particularly the case during the first half of the month, and while there is no very definite improvement as yet, there is a much better feeling, and instead of a weak, faltering market, there is a degree of steadiness which betokens better prices, under a very moderate increase in the demand. In other words, confidence is strong at the low figures now ruling. Buyers are not loading up very heavily, neither are sellers crowding things to an extent that affects prices. There is plenty of material for any good buyer at current rates, but there are fewer opportunities for shading, all of which indicates that prices are pretty well down to rock bottom. The only unfavorable feature is that no large sales have been made, and as yet transactions are mostly hand to-mouth lots. However, as already mentioned, the turn during the past week, so far as there is a turn, is in the direction of improvement, beyond that we can only follow Mr. Micawber's plan of "waiting for something to turn up."

Pig Iron.—The sale at Allentown appears to have had no unfavorable influence, the prices realized being about in line with the general market. At Sheriff's sale $12 at furnace is not a bad price for Gray Forge, neither is $14 for No. 1x, which we understand were about an average for the lots sold. Apart from this, business has been of a routine character, and confined mostly to small lots at pretty full quoted rates. Of course the market is not in a condition to stand much pressure of outside lots, but for some days past nothing of this character has been met with. As a matter of fact, it begins to look as though there was some skirmishing for position, buyers standing off to see what degree of anxiety sellers will show to get bids, and sellers waiting to see how anxious buyers are to get offers. As we said before, there is plenty of Iron at quoted rates, but it is by no means certain that it can be had at concessions, always excepting chance lots, forced sales, new brands, &c. Taking everything into consideration, we should say that the market is better than it was a week ago, but not to an extent that warrants strong talk in regard to the immediate future. That will depend upon circumstances. The position is one in which a quick response would be made to a better demand, but it must also be conceded that it is not strong enough to resist pressure to sell. The market needs careful nursing, but it looks healthy, and with a reasonable fair chance will probably develop strength. General quotations are about as follows, with the usual concessions on Southern brands for deliveries at points 50 to 100 miles south and west of Philadelphia:

American Scotch, No. 1x	$17.50 @ $18.00
American Scotch, No. 2x	17.00 @ .....
Standard Penna (Lake Ore), No. 1x	16.50 @ 17.00
Standard Penna. (Lake Ore), No. 2x	15.00 @ 15.50
Standard Penna. (Lake Ore), No. 2 plain	14.50 @ 15.00
Lehigh and Schuylkill, No. 1x	16.00 @ 16.25
Lehigh and Schuylkill, No. 2x	15.00 @ 15.25
Standard Virginia, No. 1x	15.25 @ 16.00
Standard Virginia, No. 2x	14.50 @ 15.00
Medium Va. and Southern, No. 1x	15.00 @ 15.25
Medium Va. and Southern, No. 2x	14.25 @ 14.75
Standard Penna. and Virginia Forge	14.00 @ 14.50
Ordinary Forge Cinder mixed	13.00 @ 13.25
Hot-Blast Charcoal	18.50 @ 21.00
Cold-Blast Charcoal	24.00 @ 26.00

Muck Bars.—The market is not active, but there is some inquiry with a possibility of sales at $25 25 @ $25.50 delivered Philadelphia. Sellers ask $25.50 @ $25.75, with small sales at the inside figure.

Steel Billets.—Business in this department may be called disgustingly dull, and hardly permits of any fair judgment in regard to prices. Consumers bought heavily about a month ago and are, therefore, not needing additional material, although on such small lots as are called for an advance of 30¢ to 50¢ ℔ ton appears to be paid. Makers are full for 30 to 60 days ahead and are, therefore, not caring for immediate orders unless at about the advance named. What the result will be when large buyers are in the market again remains to be seen, although, of course, when a contract is finished it is finished at both ends, so that sellers will be in the market as well as the buyer. It looks as though it might be a case of "who speaks first." Meanwhile $25.25 @ $25.50 is quoted for Schuylkill Valley deliveries, and $25 @ $25.25 Susquehanna Valley.

Steel Rails.—Nothing new in the Eastern market. Sales of small lots are fairly numerous at $30 at mills, but large orders are not in sight at the moment. A 4000 ton sale was made by the Colorado Com-

pany at $36 50 at mill to the Denver & Rio Grande Company, and it is understood that the Illinois Steel Company is doing fairly well at from $30.50 @ $31.50 f.o.b. cars at mills.

Bar Iron.—The market does not show much animation, and prices show more or less irregularity. Mills that have an established trade, and good reputation for quality, manage to run tolerably full at fair prices, but in other directions competition is sharp, and to secure anything like good sized orders, extremely low figures have to be quoted. The range may be given as 1.70¢ @ 1.75¢ for city deliveries, or 1.60¢ @ 1.65¢ at interior points, and still lower prices for anything that is not known as strictly first-class quality.

Plates.—The demand is improving, and although prices are low and unsatisfactory, recent movements seem to show that better times are near at hand. Nevertheless, mills are open for a great deal of work at current prices, and until they are better employed than at present, it is hardly to be expected that higher figures can be obtained. Inquiries are more numerous than they have been for some time past, and it begins to look as though orders would be coming in from consumers, who absorb heavily when they are fully employed, as they are likely to be during the spring and summer months. Prices are quoted about as follows, with more steadiness than for some time past:

	Iron	Steel.
Tank Plates	1.80 @ 1.90¢	1.85 @ 1.95¢
Shell		2.15 @ 2.20¢
Flange	2.70 @ 2.90¢	2.40 @ 2.50¢
Fire-Box	3.00 @ 4.00¢	2.70 @ 3.20¢

Structural Material.—Business is gradually picking up in this department and leading mills are accumulating orders. As a rule, they are better situated than they were a year ago at this time, and the general feeling is one of confidence in the ultimate outcome of the summer's business. Prices show steadiness, and under a very moderate increase in demand, might possibly be advanced a little. Meanwhile quotations are about as follows: From 1.85¢ to 2¢, delivered, for Bridge Plates; 1.9¢ @ 2¢ for Angles, and 2.25¢ @ 2.40¢ for Beams, Channels or Tees.

Sheets.—There is some improvement to note in this department, inquiries being numerous and sales a trifle larger than during several preceding weeks. Prices are steadier, although some makes are still offered at extremely low figures, but for standard qualities quotations are about as follows:

Best Refined, Nos. 14 to 20	2.70¢ @ 2.80¢
Best Refined, Nos. 21 to 24	@ 3.10¢
Best Refined, Nos. 25 to 26	3.20¢ @ 3.25¢
Best Refined, No. 27	3.40¢ @ .....
Best Refined, No. 28	3.50¢ @ .....
Common, ¼¢ less than the above.	

Quotations given as follows are for the best Open-Hearth Steel, ordinary Bessemer being about ¼¢ lower than are here named:

Best Soft Steel, Nos. 14 to 20	3¢ @ 3⅛¢
Best Soft Steel, Nos. 21 to 24	3⅛¢ @ ....
Best Soft Steel, Nos. 25 to 26	3¾¢ @ ....
Best Soft Steel, Nos. 27 to 28	4¢ @ ....
Best Bloom Sheets, ¼¢ extra over the above prices.	
Best Bloom, Galvanized, discount	@ 67½ %
Common, discount	@ 70 %

Old Material.—There is not much demand, but there is something doing all the time at about the figures quoted herewith. The supply is large, however, so that prices are not very firm, and under pressure to sell are liable to shade off quite rapidly. In a general way, however, sales are made at about the following figures: Iron Rails, $20 asked, spot (and sales at $21, delivered to mill in Schuylkill Valley,; Steel Rails, $16 @ $17, delivered; No. 1 Railroad Scrap, $19 @ $20, Philadelphia, or for deliveries at mills in the interior $19 @ $20, according to distance and quality; $13 @ $14 for No. 2 Light; $13.50 @ $14 for best Machinery Scrap; $13 for ordinary; $13 @ $14 for Wrought Turnings; $9 @ $10 for Cast Borings, and nominally $22 @ $24 for Old Fish Plates, and $16 @ $16.50, delivered, for Old Car Wheels.

Cleveland.

CLEVELAND, Ohio, April 4, 1892.

Iron Ore.—The best information obtainable this week is to the effect that the Ore now being sold—and it is not claimed that the amount is large—is at practically the same prices paid last year. With the Pig Iron market in the dumps, the furnacemen are not likely to contract for big quantities of Ore at advances of from 30¢ @ 50¢ ℔ ton over last season's prices. If the Pig Iron trade should suddenly revive there is little doubt of a brisk demand for Ore even at the prices set by the Carnegies and the Illinois Steel Company in their ante-season purchases. If a vessel was to be chartered to carry Ore from Ashland or Two Harbors to Cleveland to-day, the price would more likely be $1 than $1.25 per ton. Perhaps $1.10 would be about the figures with the Escanaba rate close around 85¢ per ton. The agent of one of the largest Ore firms in the city said to day: "Ore is being sold at last year's figures right along, but the fact is not generally advertised. Buyers would be very silly to rush into the markets, buy up big quantities of Ore at the ostensible quotations of to-day when they have a splendid opportunity of getting all the material they want at the figures prevailing in 1891. Here are some figures of interest. Ore shipped from Cleveland to the furnaces in March, 1892, 140,000 tons; for March, 1891, 45,000 tons. Ore shipped the past week, 34,000 tons; same week last year, 8500 tons. Navigation is likely to open within two weeks, and by that time the market may materially improve.

Pig Iron.—An important local election is in progress to-day, and many of the offices in the Iron district are closed on that account, but this does not noticeably change the situation. The market is dull; so dull, in fact, that dealers can give you no reliable quotations. Here in Cleveland the belief obtains that the cut down in production is bound to bring about better prices and a better demand. This result may, of course, be hastened by temporary reductions in wages and in rates of transportation, but almost nothing is being done here. Of course, prices are no lower; they could not well go below the quotations prevailing for the past eight or ten weeks, but there are no sales of any amount. Practically, all the big furnaces representing Cleveland capital are banked, and are not likely to resume operations until they can do so with some prospect of paying expenses. The reported placing of several orders from the big railroad companies encourages a few dealers to hope that there will be a little improvement within a few weeks.

Old Rails.—The week just closed has been a quiet one and very little has been done. We hear of a sale or two at $21 ℔ ton, but the amounts involved were small.

Manufactured Iron.—The mills seem fairly well engaged but not actually busy. Bar Iron is still quoted at 1.60¢ @ 1.65¢ at the mills, 60 days, 2 % off for cash. Sheets continue scarce and prices are out of harmony with the rest of the market.

Scrap.—No new features are noticeable. Instead the market is very dull and the demand is very slight. No. 1 Railroad Wrought at $18 @ $18.25, and Cast Scrap at $12.75 @ $13 are nominal quotations.

Nails.—Trade is a little more satisfactory but prices are unchanged. Steel Wire Nails being quoted at $1.80 and Steel Cut Nails at $1.65 ℔ keg in stock with a fair demand.

St. Louis.

Office of *The Iron Age*,
Bank of Commerce Building,
ST. LOUIS, April 4, 1892.

Pig Iron.—The volume of business has shown a gratifying increase during the past week, and the general tone of the market is improved. Prices, it is true, remain unchanged, but they do not go lower and appear to have now reached bottom, which point has been anxiously looked for for some weeks past. Consumers are not disposed to figure on delivery much beyond the next 60 to 90 days, and in a great many cases prompt delivery is demanded. Manufacturers who are users of Pig Iron are all enjoying a good trade, and state the outlook was never better for a large spring business. Under the circumstances it seems only a question of time when these concerns will be in the market for their supplies, and with the demand from this quarter the chance for some improvement in prices seems possible. The extreme low quotations which have been ruling for two months past have been gradually withdrawn from the market, and the outlook is materially improved in consequence. Gray Forge, which has been particularly weak, shows signs of strength, and sales have been made at prices as quoted below. The market can be described as being in a much better condition, with a fair prospect of continued improvement from this time on. For ordinary quantities we quote as follows for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry	$14.50 @ $15.00
Southern Coke, No. 2 Foundry	13.75 @ 14.25
Southern Coke, No. 3 Foundry	13.00 @ 13.50
Gray Forge	12.75 @ 13.00
Southern Charcoal, No. 1 Foundry	16 75 @ 17 25
Southern Charcoal, No. 2 Foundry	16.00 @ 16.50
Missouri Charcoal, No. 1 Foundry	15.00 @ 15 50
Missouri Charcoal, No. 2 Foundry	14.75 @ 15.25
Ohio Softeners	17.75 @ 18.75

Bar Iron.—Sales during the week have been limited to small quantities. The car manufacturers have bought about all they will require, and are now practically out of the market. Jobbers are beginning to take some interest in the market, and will no doubt shortly be in the market for their spring stocks. Prices are fairly well maintained as follows, carload lots, f.o.b. cars at East St. Louis, 1.60¢ @ 1.62½¢, half extras. Small lots from store command 1.70¢ @ 1.75¢, according to quantity.

Barb Wire.—The demand has shown increased activity, and mills have about all they can comfortably handle. In the face of this, and the fact that the month of March was the largest in volume of any corresponding month for years, prices are lower. Under date of April 1, a new card was issued quoting as follows: Less than car lots of Painted, $2.50; Galvanized, $2.95. Carload orders are filled at 10¢ ℔ cwt. less than these prices.

Wire Nails.—In sympathy with Barb Wire, Nails are weak and unsteady. Mills quote $2 ℔ keg for less than car lots, and 10¢ ℔ cwt. less for carload quantities. Jobbers quote $2 10 for small lots from store. The spring trade promises to be large, and may prove beneficial to prices.

(*By Telegraph.*)

Pig Lead.—Transactions in this metal have been limited to small quantities for prompt delivery, the improvement in prices noted in last week's report continues and offerings are limited to a certain extent at

4.05¢. No sales have been made at this figure, however, but several lots realized 4.02¢. The market is steady and firm, but as the demand does not show any material improvement the outlook for any further advance is not particularly encouraging.

Spelter.—In sympathy with the foreign market this metal has shown some improvement. Sales are reported at 4.30¢, which is the highest point reached for two months past. Demand is not active, however, and it is hard to discover what there is in the situation to warrant any further improvement.

E. A. Bayrd, manager of the St. Louis house of Matthew Addy & Co., has just returned from a ten days' tour of the Southern furnaces.

W. P. Schureman, formerly of Weyer & Schureman, and later as W. P. Schureman, agent for Sterling Steel Company, dealer in Copper, &c., left St. Louis a few days since to settle in Aztec, Ariz. Ter. Mr. Schureman is secretary of the Christoval Construction and Mercantile Company, Limited, who will carry a line of groceries, grain, dry goods, hardware, lumber, &c. Mr. Schureman has made many friends among the merchants of St. Louis, who while regretting his departure, will all wish him well in his new field.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, April 5, 1892.

The volume of business for the week under review was small, no transactions of any magnitude coming to the surface. The opinion still prevails in certain quarters that bottom has been reached, and that any change must be for better prices. In regard to this, however, it is a noteworthy fact that just as soon as prices show a tendency to stiffen up, or show a slight advance, buyers hold off, and history shows that it is harder to hold a market level in the absence of business than when the trade is buying freely. As we have before stated, prices may fluctuate to some extent, but in the face of certain conditions now confronting the market any marked advance in values is next to impossible.

Pig Iron.—There is no change to note since our report of last week, with the exception that there was a considerable falling off in business as compared with the previous weeks. It can be safely stated that prices are firmer than they were a month ago, but this does not imply that any advance in prices has taken place. This better feeling has been brought about by the fact that the furnaces as a rule, have a good many orders booked for future delivery, and are not compelled to scour the market in order to find buyers for their Iron. On the other hand, buyers do not seem to be impressed with the idea that they must get under cover before the market advances, but are content to buy only as their needs demand. They argue that at the rate we are now making Iron, coupled with the immense stocks, which are steadily being increased, it will take something out of the ordinary to bring about any advance in prices. We have advices that a reduction in carrying rates on Coke from the Mahoning and Shenango valleys will be announced in a few days. It is stated that several large contracts for Coke are held back until this reduction has been announced. For the past week prices have not changed, and we repeat our quotations of the week previous as follows:

Neutral Gray Forge	$12.75 @ $13.00, cash
White and Mottled	12.50 @ 13.00, "
All-Ore Mill	13.75 @ 14.25, "
No. 1 Foundry	14.75 @ 15.00, "
No. 2 Foundry	14.10 @ 14.35, "
No. 3 Foundry	13.75 @ 14.00, "
Bessemer Iron	14.50 @ 14.75, "
Warm-Blast Charcoal	18.50 @ 20.00, "
Cold-Blast Charcoal	25.00 @ 27.00, "

Bessemer seems to have settled down to $14.50 @ $14.75. The few transactions reported for last week, none of which reached more than 1000 tons, were at prices ranging from $14.50 @ $14.75, according to the deliveries.

Steel Billets.—The amount of business done last week was much smaller than for any previous week for some time past. Our makers here are holding firmly at $23, and attempts to place orders at less than the above price have been unsuccessful. Makers as a rule are full of business, and are content to work up orders now on hand before entering into new contracts. Some of our soft Steel makers here have booked orders for Billets for delivery to Pipe and Tube mills to be worked up into Pipes and Tubes. This is experimental as yet, but it is the firm belief that in a short time Soft Steel will have entirely replaced Iron for the above purposes. We continue to quote at $23 and $23.25, according to the nature of the orders and the deliveries.

Ferromanganese.—In addition to the two lots of foreign Ferromanganese noted in our issue of last week as having been sold in this market, we are advised of two more transactions. One is for 50 tons, for immediate delivery, at $62.50 delivered. The other is for a very much larger quantity, the deliveries running from July to December, both inclusive. The price was not made public but is very close to $62.50. Domestic continues to rule at $62.50 @ $63.

Structural Material.—The demand does not show any improvement, and as a consequence prices are weaker. Of course, a fair run of business is going, but it does not come up to expectations in view of the opening of the building season. We quote as follows: Beams and Channels on a basis of 2.10¢ for desirable orders, and 2.20¢ small lots; Angles, 1.90¢ @ 1.95¢; Universal Mill Plates 1.90¢ @ 2¢; Tees, 2.50¢; Refined Iron Bars 1.75¢; Steel Bars 1.75¢.

Steel Plates.—A slightly better demand is going, and the outlook for a further increase in business is bright. With the immense capacity some of our mills have for production it requires large orders and plenty of them to keep them fully employed. We quote as follows: Fire Box, 3.75¢ @ 4.15¢; Flange, 2.25¢ @ 2.30¢; Shell, 2.15¢; Tank, 1.90¢ @ 1.95¢.

Wire Rods.—The continued idleness of the Joliet mill of the Illinois Steel Company has caused some business to be placed here that otherwise we would have hardly obtained. We continue to quote at $32.50 at mills, and are advised of three transactions aggregating 1650 tons for prompt delivery at a price about equivalent to the one quoted above.

Muck Bar.—The demand is next to nothing, and it is not believed that it will improve. Once in a while a few tons change hands, but as long as Soft Steel is much cheaper than Muck Bar, the latter will have to make way for it. We quote nominally at $24.50, in the absence of business.

Nails.—A slightly better demand for Cut Nails is reported. The mills in the Wheeling district are running fuller than for some time past. We continue to quote $1.50 for 30¢ averages, f.o.b. in Wheeling district. In Wire Nails a moderately large demand is going and the mills as a rule are all fully employed. A meeting of the Wire Nail makers of the Pittsburgh and Cleveland district was held in the Hotel Duquesne here last week. No action of importance was taken, and no change was made in prices. The meeting adjourned with the understanding that another meeting will be held in Chicago at an early date. Prices are maintained at $1.70 in carload lots, $1.75 in less quantities. Rumors that these prices are being shaded are going, but, as far as we can learn have not been substantiated.

Wrought-Iron Pipe.—A few concerns state that they are fairly well supplied with business, but as a rule the demand is far from satisfactory, and prices do not show any tendency to stiffen up. The statement appearing elsewhere to the effect that considerable Soft Steel is being sold to the Pipe mills is taken as evidence that the trade is moving in the direction of substituting Steel for Iron in the manufacture of Pipes and Tube. Discounts are unchanged and rule as follows: Butt, Black, 57½ %; Galvanized, 47½ %; Lap, Black, 67½ %; Galvanized, 55 %; Boiler Tubes, up to 2¾-inch inclusive, 55 %; 3-inches and larger, 65 %; Casing, 55 %; Inserted Joint Casing, 50 %. Business continues to be done at lower discounts than quoted above.

Manufactured Iron.—There is no change to note from what was said under this heading last week. As the time for the annual convention of the Amalgamated Association approaches, the feeling grows that the Amalgamated scale must be arranged on a lower basis, as Pittsburgh will not continue to pay $5.50 for boiling, in the face of much lower prices prevailing elsewhere. We quote as follows: No. 1 Bars at 1.60¢ @ 1.65¢, 60 days, 2 % off for cash. Bars made from Old Rails at 1.50¢ @ 1.55¢. Steel Sheared Plates at 1.90¢ @ 2¢. Iron Sheared Plates at 1.80¢ @ 1.90¢; No. 2 Sheet at 2.50¢ @ 2.60¢, 60 days, 2 % off for cash. Skelp Iron is unchanged at 1.60¢ for Grooved and 1.80¢ for Sheared, four months, 2 % off for cash.

Barb Wire.—The activity in the trade noted for several weeks past continues and the different concerns have about all the business that they can handle. We continue our quotations of last week as follows: $2.25 @ $2.35 for Painted, and $2.70 @ $2.80 for Galvanized, f.o.b. at factory, the lower prices named being for carload lots.

Steel Rails.—There is nothing new to report, no large contracts have been booked for several weeks. The Edgar Thomson mill continues to turn out a large tonnage and is understood to have considerable orders booked. Prices remain at $30 f.o.b. at mills.

Railway Track Supplies.—The repairs and extensions of equipment now being made by railroads to handle the coming heavy traffic to the World's Fair are having their effect on Track Supplies, and considerable business is being done. Prices are unchanged and we repeat quotations of last week as follows: Spikes, 2.15¢, 30 days; Splice Bars, 1.70¢ @ 1.80¢; Track Bolts, 2.65¢ with Square and 2.75¢ for Hexagon Nuts.

Old Rails.—There is little or nothing doing in Old Steel Rails. There are but two concerns in this city that buy long pieces and neither of these are in the market. We quote $16.75 @ $17 for lengths under 6 feet, $16.25 for miscellaneous lengths, and $16.50 for long lengths. Old Rails are still held at $21.75 for delivery in the Mahoning Valley, and we are advised of a sale of 100 tons that brought $22 on account of prompt delivery being guaranteed.

Scrap Iron.—Bessemer continues exceedingly dull, and in the face of the exceedingly low prices ruling, but little business is done. Scrap Iron is obtainable here at lower prices now than for a long

time past. We quote prices as follows: No. 1 Railroad Wrought Scrap, $17.50 @ $17.65 ℔ net ton; Cast Scrap, $12.50 @ $12.75 ℔ gross ton; Steel Rail and Bloom Ends, $17 @ $17.50; Cast-Iron Borings, $9.50 ℔ gross ton; Mixed Country Steel, $14 @ $14.25 ℔ gross ton.

Murdock & Co., brokers in Iron and Steel, have removed their office from Room 312, Bissell Block, to Room 713, Lewis Block.

The offices of Robinson & Orr, Iron and Steel factors, have been removed from Fidelity Building to Germania Bank Building, Wood and Diamond streets.

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, April 5, 1892.

Pig Iron.—Very much the same condition prevails in the Iron market as a week ago. There has been no large trading, but there is a steady current consumptive demand, and this seems to be increasing, probably because small quantities of Iron can be bought at satisfactorily low prices and there seems to be no inducement to anticipate wants. There is abundance of Iron offered and parties recently returned from the producing districts in the South report large stocks at many furnaces. On the contrary some of the furnaces are known to be carrying only a normal quantity, or even less. It is true, however, that lower prices have been made than ever before in some instances for prompt shipment and spot cash. The great Tennessee combination are asking an advance of 25¢ per ton for July and later deliveries, but have not been able to make sales. The current demand is largely for No. 2 Foundry Coke Iron, which sold on the basis of $10.25 at the furnace, and No. 3 Foundry at $9.50. There is also a good demand for Car-Wheel Charcoal Iron, which, being in light supply, maintains its value. The report of products and stocks on hand on April 1 is awaited with anxiety, but no one has sufficient confidence in its effect to lose an opportunity to affect a sale. Quotations unchanged, as follows:

Foundry.	
Southern Coke, No. 1	$14.25 @ $14.50
Southern Coke, No. 2	13.00 @ 13.25
Southern Coke, No. 3	12.25 @ 12.50
Ohio Soft Stone Coal, No. 1	16.00 @ 16.50
Ohio Soft Stone Coal, No. 2	15.00 @ 15.50
Mahoning and Shenango Valley	17.00 @ 17.50
Hanging Rock Charcoal, No. 1	19.75 @ 20.00
Hanging Rock Charcoal, No. 2	19.00 @ 20.00
Tennessee and Alabama Charcoal, No. 1	16.50 @ 17.00
Tennessee and Alabama Charcoal, No. 2	15.50 @ 16.00
Forge.	
Gray Forge	11.75 @ 12.00
Mottled Neutral Coke	11.50 @ 11.75
Car Wheel and Malleable Irons.	
Standard Southern Car Wheel	19.25 @ 19.50
Lake Superior Car Wheel and Malleable	18.75 @ 19.00

Detroit.

WILLIAM F. JARVIS & Co. of Detroit, Mich., report under date of April 4, 1892: There has been a much better demand during the past week, especially for Lake Superior Charcoal, and several orders, ranging from 200 to 500 tons, have been placed and buyers are coming into the market quite freely. The present outlook is much more encouraging to the sellers than for a long time past. Should nothing come up to stop the present buying movement the turning point may soon be reached. The inquiry for Southern and Ohio Irons is not equal to that for Lake Superior Charcoal, but buyers now realize that the prospects for lower prices are few and that the chances are almost all in favor of present or higher prices, and they consider it a favorable time to cover for their future wants. The only discouraging feature is the continued large production, notwithstanding the fact of a number of furnaces having gone out. With business more active and prices firm we repeat last week's quotations:

Lake Superior Charcoal, all numbers	$16.50 @ $17.50
Lake Superior Coke, Bessemer	16.00 @ 17.00
Lake Superior Coke Foundry, all ore	16.50 @ 17.50
Ohio Blackband (40 per cent.)	17.00 @ 17.50
Southern No. 2	15.00 @ 15.50
Southern Gray Forge	13.25 @ 13.75
Jackson County (Ohio) Silvery	17.75 @ 18.25

New York.

Office of *The Iron Age*, 96-102 Reade street, NEW YORK, April 6, 1892.

Pig Iron.—Allentown newspapers report that the sheriff's sale of between 5000 and 6000 tons of Lehigh Iron fetched an average of $13.50 for No. 1, and $11.50 for No. 2 Foundry, the purchasers being a local bank and representative of creditors. The tidewater freight is at 75 cents a ton. Sales agents and furnace representatives here note a better movement, and somewhat larger inquiries have come to hand than for some time past, but prices remains low and there seems no early prospects of a recovery. Negotiations are pending on some lots of Charcoal Iron, Michigan being quoted on the basis of $16.50, Buffalo. We quote Northern brands, $15.75 @ $16 for No. 1; $14 75 @ $15 for No. 2, and $13.75 @ $14 for Gray Forge, tidewater. Southern Iron sells at $15 @ $15.50 for No. 1; $14.25 @ $14.50 for No. 2 and No. 1 Soft, $13.50 @ $14 for No. 2 Soft; $13 @ $13.50 for Gray Forge.

Ferromanganese and Spiegeleisen.—Ferromanganese is quiet at $61 @ $61.50, while Spiegeleisen remains lifeless at nominally $23 @ $23.50 for 10 to 12 %, and $26.50 @ $27 for 20 %.

Billets and Rods.—Very little is doing in this market, the negotiations for a block of several thousand tons of soft Steel for New England not having been closed as yet. We quote domestic Billets $25.50 @ $26, at tidewater, and domestic Rods $35.50 @ $36. It is reported that an Eastern Rod mill, during the demoralization in the Western Billet market some weeks since, bought a round lot at $22.45 in the Pittsburgh-Wheeling district. Since then the market has steadied there and $23 is the lowest named.

Steel Rails.—The demand continues disappointingly slow, only one Eastern mill reporting sales aggregating about 5000 tons. A lot of 1900 tons of Steel Rails, from second hands, 70-pound section, made by an Eastern mill, which has been seeking a purchaser for about six months, has been at last disposed of. The Rails had been offered repeatedly at $26 without success. Eastern mills still quote $30, at mill, for standard sections.

Manufactured Iron and Steel.—During the week one of the leading architectural iron works has taken some contracts, and it is reported that the architects in the city generally are pretty busy preparing work which is likely to come out toward the close of this month or early in May. Bridge builders are figuring on a number of specifications. Among the larger contracts likely to be closed at an early date is the iron work for the new shops of the New York Central Railroad at Buffalo, for which competition is likely to be very sharp. In Plates, an order for 500 tons for the water works at Syracuse has led to what may be considered a duel between one Pittsburgh and one Eastern Pennsylvania mill, very low figures having been named. A round lot of Plates will probably come on the market for shipbuilding in Buffalo, while on the Atlantic Coast new work still hangs fire. As indicative of the condition of the local Bar Iron market, it may be stated that a railroad company recently, to cover immediate requirements, bought ten bars from store at 1.75¢ delivered. Small lots of Beams are selling at 2.40¢ @ 2.45¢, while round lots are available at 2.20¢ @ 2.30¢. We quote: Angles, 1.9¢ @ 2.10¢; Sheared Plates, 1.85¢ @ 2.25¢; Tees, 2.40¢ @ 2.75¢, and Beams, 2.30¢ @ 2.80¢; Channels, 2.25¢ @ 2.50¢, on dock. Car Truck Channels, 2¢ @ 2.10¢; Steel Plates are 1.85¢ @ 1.95¢ for Tank; 2.05¢ @ 2.25¢ for Shell; 2.35¢ @ 2.65¢ for Flange; 2.55¢ @ 2.75¢ for Marine, and 3¢ @ 3.25¢ for Fire Box, on dock. Bars are 1.7¢ @ 1.9¢, on dock. Scrap Axles are quotable at 2¢ @ 3.10¢, delivered. Steel Axles, 2¢ @ 2.1¢, and Links and Pins, 2.05¢ @ 2.20¢; Steel Hoops, 1.9¢ @ 2¢, delivered.

Merchant Steel.—Complaints of low prices, made particularly by Western mills in the Eastern territory, are frequently heard. We quote: Hot-Rolled Shafting, 1.90¢ @ 2¢; Machinery, 1.90¢ @ 2.10¢; Tire, 2¢ @ 2.25¢, Toe Calk, 2.20¢ @ 2.35¢, and Tool Steel, 5¼¢ @ 6¼¢, delivered.

Track Material.—The market is weak, and Spikes are sold down to 1.95¢ @ 2¢, Angles remaining nominally 1.65¢ @ 1.70¢, and Bolts, 2.60¢ @ 2.75¢, delivered.

Old Material.—The market is very dull. One lot of 200 tons of Old Iron Rails, American, brought only $19, on cars Jersey City, and further lots are offered at the same price. Choice Railroad Scrap has sold at $18 and No. 1 Wrought is offered at $17.

The American Pig-Iron Storage Warrant Company report as follows:

	Tons.
Stock in yard February 29, 1892	57,700
Put in yard for 31 days ending March 31, 1892	5,900
Total	63,600
Withdrawn 31 days ending March 31, 1892	1,400
Net stock in yard March 31, 1892	62,200

Metal Market.

Copper.—There have been no new developments the past week. Gossip regarding combinations of producers to regulate production and prices has ceased, and in its place the statement is going the rounds that supply and demand is the sole influence governing the movements of values, and that consumption is of sufficient volume to keep the market in good form. In support of this claim the fact is cited that leading Lake Superior producers have been shipping considerable Copper overland for delivery on contracts, instead of waiting for the opening of navigation, and that their surplus has been reduced to comparatively small proportions. For the present, consumers are indifferent buyers, however, the larger ones having made liberal provision for future wants, while the smaller interest buy as usual according to immediate needs. From second hands small lots of Lake Superior Ingot may be secured at 11.90¢ @ 11.95¢, but anything below 12¢ for carloads is the exception, and smaller quantities are held at 12¼¢. Wire bars in round lots are also quoted at the latter price. Casting brands about 11¼¢ for carload or larger lots, and 11¾¢ upward for

small parcels out of store. The monthly report of the bureau of statistics afford the following comparison of exports from the United States:

Ore.

To.	—February.— Tons. 1892.	Tons. 1891.	—Eight mos.— ending Feb. 29. Tons. 1892.	Tons. 1891.
United Kingdom	2,723	4,587	20,315	22,401
Germany	.....	246	1,013	824
Other Europe	.....	95	100	306

Ingots

To.	lb.	lb.	lb.	lb.
United Kingdom	445,815	941,590	12,293,571	3,342,783
Germany	1,045,483	206,714	5,312,737	482,764
France	991,487	2,650,480	17,851,388	5,178,689
Other Europe	554,425	1,636,729	10,695,140	3,193,585
Other countries	5,000	10,000	46,031	57,900

Pig Tin.—In the face of adverse statistical exhibits and sluggish demand for the metal, prices have been carried somewhat higher in both this and the European markets. No fresh speculative interest has been attracted, nor does trade demand appear to have been stimulated in the least by the turn in prices. Hence a quiet, although superficially stronger market, with an advance of about ¼¢ ₱ lb to go on record for the week. Late business was done at 20¢ @ 20.05¢ net cash for Straits, 10-ton lots, and 20.15 @ 20¼¢ regular for jobbing quantities; 20½¢ for English L. & F. and 20¾¢ for Banca out of store.

Pig Lead.—Business has been on a very moderate scale, with sales of larger quantities than single carload lots few and far between. The demand has continued slow as well. The supply on spot is moderate, however, and smelters are offering reservedly for early shipment, since relatively better prices than those touched here thus far are obtained in the West, thus keeping the market quite firm. On actual sales 4½¢ seems to be the highest price reached here, but purchases were reported at 4.10¢ in Chicago, which is equivalent to 4.30¢ landed here.

Spelter.—It is reported that nearly or quite 1500 tons of Western have been sold recently for export, the greater portion of which is understood to be for French account. Home consumers have made more purchases also and, upon the whole, the market seems to be in better shape, with 4.60¢ apparently the lowest price at which ordinary brands can be obtained. There is little or nothing on offer at present for shipment from the West within the next 30 days, and only small quantities on the spot.

Antimony.—The market is rather slow and prices have shown a leaving in buyers' favor. Current quotations are 10¾¢ for Hallett's 12½¢ for LX, 14¾¢ for Cooksons', and 13¢ for "Crown" brand. The latter is a new brand in this market and is represented as showing, upon assay, 99.76% pure Antimony.

Tin Plate.—In spot goods there has been an uneven and barely average business for the season, and orders for future deliveries still run rather slow, leaving the market in a dull and uninteresting condition. Plates out of store are held at practically the same prices that have ruled for some time past, but concessions are of frequent occurrence on futures, particularly where good sized lots of Cokes may be involved. We quote as follows for full weights: Coke Tins—Penlan grade, IC, 14 x 20, $5.25; J. B. grade, do., $5.35; Bessemer do., $5.30; Siemens Steel, $5.37½. Stamping Plates—Bessemer Steel, Coke finish, IC basis, $5.60 @ $5.65; Siemens Steel, IC basis, $5.75 @ $5.80; IX basis, $6.80. IC Charcoals—Melyn grade, ½ X, $6.40; for each additional X add $1.50; Allaway grade, $5.75; Grange grade, $5.85; for each additional X add $1.20, Charcoal Ternes — Worcester, 14 x 20, $5.75; do., 20 x 28, $11.35; M. F., 14 x 20, $7.37½; do., 20 x 28, $14.75; Dean, 14 x 20, $5.50; do., 20 x 28, $10.60; D. R. D. grade, 14 x 20, $5.35; do., 20 x 28, $10.25; Mansel, 14 x 20, scarce; do., 20 x 28, $10 50; Alyn, 14 x 20, $5.45; do., 20 x 28, scarce; Dyffryn, 14 x 20, $5.65; do., 20 x 28, $10.90. Wasters—S. T. P. grade, 14 x 20, $5.10; do., 20 x 28, $10; Abercarne grade, 14 x 20, $5; do., 20 x 28, $9.70.

The Anglo American Iron and Metal Company, 96 John street, have been appointed sales agents for the Crown brand of Antimony in the American market.

Coal Market.

The Anthracite Coal trade is passing through a critical stage, but the Reading combination is everywhere looked upon as an accomplished fact, not to be seriously affected by attempted obstructions, either on the part of New Jersey or Pennsylvania. The conspicuous feature is the scramble between the Reading and Pennsylvania Railroad coporations to gain control of the individual colleries, which heretofore have been independent, and it would be difficult to determine at present which has had the best success in this endeavor, as the last named is most reserved in its statements of events taking place, for prudential reasons. The big firm of operators, Coxe & Bros., whose controversy with the Lehigh Valley Railroad will be remembered, respecting the equitable rates of toll, not only remains independent but has secured additional colleries and is perfecting its railway connections. The Anthracite trade is dull, but firm, and in regard to prices it may be stated as the net result of recent events that operators are getting now what before they asked and vainly endeavored to realize. "They are gradually getting up to the schedule price," one of them states, but "buyers must be educated up to the price;" hence the hesitation, especially in prospect of a warmer season. Free Burning White Ash, f.o.b. at New York shipping ports—meaning Hoboken, Weehawken, Port Johnson, Port Elizabeth, Perth and South Amboy—is selling as follows: Broken and Chestnut, $3.65; Egg, $3.75, and Stove, $3.90; but Chestnut can be bought as low as $3.25, f.o.b., which is 40 cents below the combination. In regard to the effects of combination, some middlemen have closed; others will handle some of the special Coals controlled by the combination. Railroad tolls remain unchanged and there is said to be no prospect of a reduction.

A disaster of some importance is the flooding of the Nottingham shaft of the Lehigh and Wilkesbarre Coal Company by the Susquehanna River, as supposed from a leak in the river's bed, under which the slope extends. This is the mine from which the Plymouth Red Ash principally comes, and its stoppage for several months will be a serious matter for those who depend on that special Coal.

Bituminous Coal is firm and fairly active at about last year's prices, except as an attempt is being made to advance transportation rates on the Beech Creek Railroad, which will make dearer Coal if the effort succeeds.

The Coal sales agents at their meeting last week fixed the April allotment at 2,500,000 tons.

The total amount of Anthracite Coal sent to market for the week ending March 26 was 635,583 tons, compared with 512,907 tons in the corresponding week last year, an increase of 122,676 tons. The total since January 1 is 8,571,393 tons, a decrease of 695,689 tons, compared with the same time in 1891. Freights from New York to Boston and discharge are 60¢ @ 75¢.

The Pennsylvania Railroad reports for the week 245,000 tons and for the year 3,017,000 tons, the latter a decrease of 367,000 tons Reading sent 23,000 tons to Port Richmond and 19,000 tons to New York.

The average of Anthracite Coal prices in Schuylkill County, in March, was $2 29, as against $2.23 in February, $2.22 in March last year and $2 24½ in March, 1890. The price is about 4¢ above the March average of the last seven years, including the year of the great Reading strike.

Financial.

The new stage of the silver agitation brought about by the action of Congress is, perhaps, the most potent factor just now in the financial world. The silver faction summoned their energies for a decisive vote, and were defeated. As remarked by a veteran banker in Wall street, the vote "means beyond all question that there is a point beyond which the people of the United States are resolved not to go in committing the country to the silver basis. It means that there is no longer any real danger of our being landed upon an exclusive silver basis—which was the logical and inevitable issue of the Bland bill." This prolific source of disturbance removed, the markets for our leading commodities are left to respond to natural influences, and a gradual restoration to a more healthful state of trade, under normal conditions, is but a reasonable expectation. Among other indications the return of American securities held abroad will be particularly observed, for if continued in any considerable amount, along with an increasing volume of imports and decreasing exports, an outward flow of gold could not well be averted. A shipment of $600,000 to Paris was the first for several weeks. The check to free silver is naturally followed by a further decline in bullion, which dropped as low as 85¼, the lowest price recorded in modern times, but heavy export engagements occasioned reaction. Henceforth legitimate commercial values are likely to rule, rather than speculation. Respecting the state of trade authorities are not agreed, for while one speaks of stagnation and lower prices another discovers distinct improvement, particularly in the marketing of manufactured products. Doubtless the improvement referred to may be to some extent prospective.

Grain is cheaper because of discouraging foreign news and improved crop prospects, and in flour the export demand is slow. Corn continued on the downward turn, and cotton was dull. Coffee was nominal. Provisions had a steady support. Ocean freights declined. Exports of wheat and flour from United States ports during March were nearly 18 % less than during the previous month, but corn exports are still heavy compared with former years. Dry goods jobbers notice much more activity in handling spring and summer specialties.

In the Stock Exchange market speculation growing out of the Reading deal was the prominent feature, and conjecture was rife respecting the probable action of the Governor of New Jersey upon the bill before him legalizing the Reading leases. On Tuesday the Governor's veto was announced, his objections being based chiefly on constitutional grounds, but was without effect, having been anticipated. At the same time there was a break in New England, which sold below 40, perhaps due to a report that through facilities would be cut off by the New York, New Haven and Hartford, though it had been stated that no rivalry would exist. Sugar Refiners' declined on a rumor that stock which had been given for the Philadelphia

refineries, recently acquired, was being sold, and the fall in these properties more or less affected the whole list. The failure of the Free Silver Coinage bill in the House of Representatives and the adoption by the Senate of the Bering Sea treaty had no perceptible effect. One feature was a decline in bar silver in London to 39 pence per ounce. Larger east-bound shipments from Chicago were reported as encouraging for western roads and the trunk lines.

The weekly statement of the New York City Associated Banks showed an increase in reserve of $10,525. The banks now hold $18,017,950 in excess of the legal requirements. The changes in the averages show a decrease in loans of $710,200, an increase in specie of $675,800, a decrease in legal tenders of $31,300, a decrease in deposits of $1,673,300, and a decrease in circulation of $31,300.

Foreign exchange steadily hardened, commercial bills being in light supply against demands for remittance. Rates closed $4.87½ @ $4.89.

Money is easy. There was an abundant supply offering on time, and there was practically no demand. Rates were 3 per cent. for 30 to 60 days, 3½ for 90 days to 4 months, and 4 for 5 to 6 months on good Stock Exchange collateral. There was a good demand for commercial paper.

The monthly Treasury statement shows a net decrease in the public debt in March of $1,993,041. Compared with a year ago, the net gold balance has been reduced over $22,000,000. The net silver balance is slightly less than the amount a year ago. Another statement shows that the expenditures for the fiscal year thus far exceed those of the corresponding months of the previous fiscal year, while the revenue has materially diminished, the fact appearing that the aggregate decrease of revenue for the nine months, compared with the corresponding period of the previous year, has been $47,000,000.

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, April 6, 1892.

Prices for Pig-Iron Warrants have averaged somewhat lower the past week, in the face of a further reduction in stocks in Connal's stores. Last reports showed 484,000 tons of Scotch and 136,000 tons of Cleveland there, while Scotch warrants are down to 40/9, Cleveland to 36/10½, and Hematite to 46/1½, the latter reacting to 46/5. Operations have been on a moderate scale, neither the reduction in stocks nor the curtailment of production exciting any outside interest. At present there are only 13 Cleveland furnaces in blast, against 83 a month ago, and it is rumored that more will blow out before the end of the week. The returns for March show that production that month was but one-half of the February output.

The Pig Tin market has been firmer at higher prices, due to freer buying on the part of consumers and covering of short sales. Visible supply has increased, but spot stocks are somewhat smaller.

Speculation in Copper has been brisk, with prices low and irregular early in the week, but subsequently higher under the influence of the rise in silver and reports of progress in the "combine" movement that promise successful issue. Operators, however, are cautious and speculation is irregular. Consumption appears to be on the increase. Deliveries last month were the largest in any month since September, but visible supply increased 2470 tons. Sales of furnace material limited. Chili charters last month 1750 tons.

There has been a better business in Tin Plate at easy prices. Fair orders taken for oil sizes for both American and Russian account, and more doing in lightweight Bessemer at 11/9, f.o.b. Swansea. Business in Ternes light, but prices held firm at 22/ for doubles, owing to stoppage of Blochairn works.

Scotch Steel makers better off for orders, but forward contracts scarce.

Old Iron freely offered and prices rather weak.

Scotch Pig Iron.—Movement in makers' Iron shows no change and prices remain practically as they were last week.

No. 1 Coltness,	f.o.b.	Glasgow	53/
No. 1 Summerlee,	"	"	51/6
No. 1 Gartsherrie,	"	"	50/6
No. 1 Langloan,	"	"	51/6
No. 1 Carnbroe,	"	"	44/
No. 1 Shotts	"	at Leith	52/
No. 1 Glengarnock,	"	Ardrossan	50/6
No. 1 Dalmellington,	"	"	48/
No. 1 Eglinton,	"	"	47/

Steamer freights, Glasgow to New York, 2/; Liverpool to New York, 7/6.

Cleveland Pig.—Makers' prices are lower in sympathy with warrants. Sellers' at 37/3 for No. 3, f.o.b. Middlesborough.

Bessemer Pig.—The demand is running light and prices for makers iron are barely steady at 48/6 @ 49/ for West Coast brands, Nos. 1, 2 and 3, f.o.b. shipping port.

Spiegeleisen.—There is no improvement in the demand nor any change in values. English 20 % quoted at 77/6, f.o.b. shipping port.

Steel Rails.—Business slow and prices remain as before. Heavy sections quoted at £4 @ £4. 2/6, f.o.b. shipping port.

Steel Blooms.—The market very quiet and without change. Makers ask £4 for 7 x 7, f.o.b. shipping point.

Steel Billets.—Business of same character as heretofore, and chiefly at old prices. Bessemer, 2½ x 2½ inches, quoted at £4. 5/, f.o.b. shipping point.

Steel Slabs.—The market remains very quiet and without change. Bessemer quoted at £4. 5/, f.o.b. at shipping point.

Old Iron Rails.—Sellers offer freely and the market is easy, without quotable change in prices. Tees quoted at £2. 15/ and Double Heads at £2. 17/6 @ £2. 18/9, f.o.b.

Scrap Iron.—Dealings moderate and the market barely steady Heavy Wrought Iron quoted at £2. 10/ @ £2. 12/6, f.o.b.

Crop Ends.—Market remains quiet and unchanged. Bessemer quoted at £2. 12/6 @ £2. 15/, f.o.b.

Manufactured Iron.—Demand runs about as it has for some time past, and prices are barely steady. We quote, f.o.b. Liverpool:

	£	s.	d.		£	s.	d.
Staff. Ordinary Marked Bars	8	10	0	@		..	
" Common "	6	7	6	@	6	10	0
Staff. Bl'k Sheet, singles....	7	16	0	@		.....	
Welsh Bars (f.o.b. Wales)....	5	10	0	@		.....	

Tin Plate.—Market closes quiet, with prices rather easy. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	14/	@ 14/3
IC Bessemer Steel, Coke finish		@ 12/6
IC Siemens " " "		@ 12/9
IC Coke, B. V. grade 14 x 20	12/3	@ 12/6
Charcoal Terne, Dean grade	12/	@ 12/3

Pig Tin.—Fairly firm but rather quiet market at the close. Straits quoted at £90. 10/, spot, and £90. 15/ for three months.

Copper.—Steady market at the close, with fair business. Merchant Bars quoted at £45. 12/6, spot, and £46. 2/6, three months' futures. Best selected, £50.

Lead.—More active business at easier prices, closing steady at £10. 15/ for Soft Spanish.

Spelter.—The market fairly strong and moderately active, closing firm at £22. 2/6 for ordinary Silesian.

Imports.

Hardware, Machinery, &c.

Baldwin, Austin & Co., Mach'y, bxs., 2
Boker, Hermann & Co., Arms, cs., 2; Mdse., cs., 8; Nails, cs., 3
Crabb, W. & Co., Mach'y, cs., 2
Erie Dispatch Co., Mach'y, pkgs., 4
Fritzsche Bros., Mach'y Parts, cs., 2
Kirkal, H. B., Mach'y, cs., 30
Knauth, Nachod & Co., Ironware, cs., 17; Mach'y cs., 3
Meyer, Aubrey E., Mach'y, pkgs., 4
Meyer, Geo. & Co., Mach'y, cs., 6
Ollesheimer, Theo. & Bros., Ironware, cs., 2
Piza, Nephews & Co., Mach'y, pkgs., 2
Poux, E. C., Nails, kegs, 20
Richard, C. B. & Co., Ironware, pkgs., 198
Roessler & Hasslacher Chemical Co., Ironware, case, 1
Rotterdam Steamship Co., Ironware, cs., 15; Mach'y, cs., 2
Schmidt, Wm., Mach'y Parts, cs., 2
Sellers, W. B., Mdse., cs., 6
Strange & Bros., Mach'y, pkgs., 6
Tisch, R. G., Ironware, cs., 54
Vogt, J. H., Mach'y, cs., 2
Vom Cleff & Co., Ironware, cs., 20; Cutlery, pkgs., 4
Williams, R., Jr., Hatchets, case, 1
Weygandt, T. C., Mach'y, cs., 8

Robert H. Dixon, superintendent of the Minnesota Thresher Company, Stillwater, Minn., died at that place on March 31. Mr. Dixon had been superintendent of the works for four years, previous to which he had been connected with the Deering Harvester Works, at Chicago, in a similar capacity for 17 years, and was consequently well known in Northwestern manufacturing circles. He was a native of Ottawa, Canada, and was 50 years old.

The Suspension of Wm. R. Hart & Co.

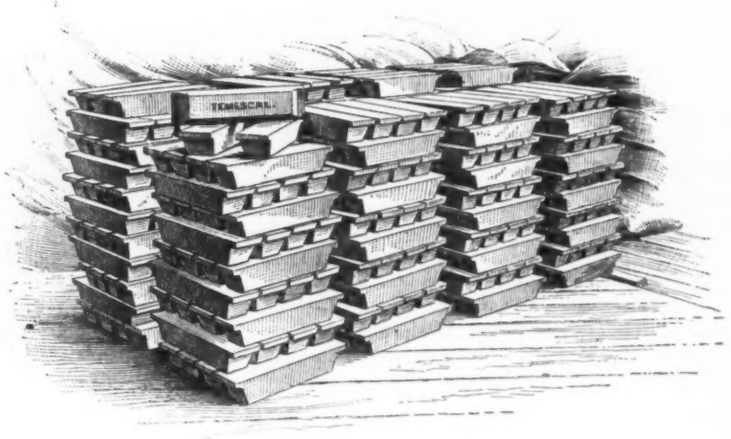
Parties connected with the iron and steel trades were surprised to learn yesterday that the well known house of W. R. Hart & Co. of Philadelphia had been compelled to make an assignment. The amount of the liabilities is not known, but will probably not be of a character to seriously affect other houses in the trade. Mr. Hart is personally one of the most highly esteemed men in the trade, and has undoubtedly handled a larger business in iron and steel than any single individual now living in Pennsylvania, if not in the entire country. For many years he was the American agent of Naylor, Benzon & Co. of London, and subsequently for other leading houses both here and from abroad. The immediate difficulty is due to a heavy loss in connection with the Lehigh Iron Company, besides having other large investments, which at present cannot be realized upon, and to avoid further complications a general assignment was made to William S. Pilling, who has been connected with the business for several years. What makes the matter still more distressing is that Mr. Hart's health is in a most precarious condition,

and remembering his long and honorable career during the past quarter of a century or more, his friends—which may be said to include everybody of any prominence—will in this time of trial extend to him their most cordial and sincere sympathy.

Temescal Tin.

The first American pig tin to be offered for sale in the New York market has reached this city from the Temescal mines of California, and has already been disposed of by Edward F. Byrne, 54 Cliff street, New York, in whose hands it was placed. The shipment consisted of 334 pigs, weighing 22,000 pounds, and is shown in our engraving as it lay on the dock.

The Temescal Mine has been in operation about four months, and with the exception of the shipment noted above, and a carload now on the way East, the product has been sold on the Pacific Coast. Only one smelter is at present at work, but steps are being taken to increase the output as rapidly as possible. It is expected that before the end of the year the mine will produce in the neighborhood of 1000 tons, and that the following year will wit-



The First Cargo of American Tin in New York.

ness double that output. The tin will be sold in the open market in competition with Straits tin for the manufacture of tin plate and other purposes. The present consignment has been distributed in small lots to manufacturers for the purpose of introducing the American article, although several parties were anxious to purchase the entire lot, one concern desiring the whole shipment to manufacture into medals. Samples of the tin have been used by Chicago tin-plate manufacturers, including Norton Brothers, who speak very highly of its quality, and manufacturers generally are anxious to use the American tin, which they pronounce satisfactory in quality. Shipments of this tin are expected regularly, probably by every steamer. The consignment already here was shipped from San Francisco to Panama by steamship, and transferred overland to Colon, where it was shipped by the Pacific Mail steamship to this port, consigned to Balfour, Williamson & Co. of the Cotton Exchange Building. Mr. Byrne, who is handling the metal, considers it an honor to be the first to introduce American tin, and predicts for it in the future a position as prominent as that attained by the American spelter made west of the Missouri River, and which he was the first to sell to brass manufacturers in this country.

Exports.

PER SHIP FREIBURG, FEBRUARY 24, 1892, FOR SYDNEY, N. S. W.

By S. Hoffnung & Co.—45 barrels Lampware.
By W. K. Freeman.—12 barrels Iron Bolts, 21 cases Iron Bolts and Nuts.
By R. W. Forbes & Son.—1 case Oil Cans.
By Strong & Trowbridge.—10 barrels Plated Ware, 1 case Cutlery, &c., 1 case Hardware.
By H. W. Peabody & Co.—1 case Hardware, 7 cases Bolts.
By Thos. C. Pollock.—2 boxes Wringers.
By Delafield, McGovern & Co.—30 cases Lawn Mowers.
By Manhattan Brass Company.—5 packages Brass Goods, 17 packages Lamp Goods.
By W. & B. Douglas.—2 boxes Pumps.
By Meriden Britannia Company.—2 boxes Silver Ware.
By Sargent & Co.—13 cases Hardware.
By Collins & Co.—220 dozen Handled Axes.
By Edward Miller & Co.—85 packages Lamp Goods.
By S. Hoffnung & Co.—1 case Tinware, 80 cases Axes, 9 packages Hardware, 3 packages Wringers, 5 cases Hardware, 2 cases Lampware, 4 packages Pumps, 7 barrels Plated Ware, 1 case Picks, 5 cases Tacks, 5 cases Scales, 14 cases Hardware, 1 case Air Guns, 1 case Gun Tools, 20 packages Lampware, 5 cases Rat Traps, 16 cases Lampware, 6 packages Lampware, 1 case Tools, 1 barrel Hardware, 8 cases Bolts, 8 cases Churns, 8 cases Hardware, 1 case Lampware, 11 packages Hardware, 2 cases Hammers, 3 cases Barrows, 6 cases Hammers, 167 cases Axes and Hatchets.
By Arkell & Douglas.—11 cases Bolts, 1 case Brushes, 1 case Wringers, 2 cases Nails, 30 cases Lanterns, 1 package Wire, 10 kegs Nails, 3 cases Scales, 30 cases Brush Hooks, 1 dozen Hay Knives, 8 racks Churns, 1 case Pumps, 2 cases Stove Trucks, 650 reels Barb Wire, 114 cases Axes, 8 cases Plated ware, 8 cases Hoes and Rakes, 47 cases Tools, 27 cases Cartridges, &c., 28 cases Choppers, 34 cases Lampware, 2 cases Wringers, 90 packages Hardware.
By Australasian-American Shipping Co.—5 cases Nuts and Bolts.
By H. H. Moore.—19 cases Bolts, 2 cases Money Drawers, 1 case Hardware, 5 cases Axes, 4 cases Hardware, 1 case Rakes and Forks.
By W. H. Crossman & Bro.—1 case Drills, 2 packages Pumps, 12 crates Churns, 1 case Hammers, 1 case Cutlery, 90 boxes Axes, 10 cases Hatchets, 20 kegs Staples, 10 dozen Axes, 4 Tire Benders, 3 dozen Rifles, 18 Lawn Mowers, 17 cases Lamp Goods, 55 packages and 21 cases Hardware, 1 crate Carriage Hardware.
By Ilsley, Doubleday & Co.—8 cases Hardware
By H. H. Moore.—1 case Lamp Goods, 5 cases Picks, 3 cases Axes, 1 case Hardware, 1 barrel Blocks, 1 box Pumps, 12 cases Lanterns, 1 case Hammers, 2 cases Corn Mills, 5 cases Bolts, 1 case Snaths, 1 case Hardware, 6 boxes Nails, 2 cases Hardware.

PER BARK HENRY L. GREGG, FEBRUARY 29, 1892, FOR CAPE TOWN, SOUTH AFRICA.

By M. Berliner.—2 cases Lamps.

PER BARK ABBOTT, MARCH 3, 1892, FOR DUNEDIN, NEW ZEALAND.

By F. R. Plumb.—11 cases Tools.
By S. Hoffnung & Co.—1 case Picks, 7 packages Lamp Goods.
By H. W. Peabody & Co.—18 cases and 2 packages Hardware, 6 packages Hardware, 6 packages Lawn Mowers, 3 cases Axes, 3 packages Hardware, 11 packages Lawn Mowers, 5 pacpages Lampware, 17 packages Hardware, 10 packages Lawn Mowers, 2 cases Pumps, 8 cases Horse Nails, 3 cases Cork Pullers, 5 cases Tacks, 100 reels Barb Wire, 1 case Seed Sowers, 6 cases Wringers, 2 cases Hardware, 6 cases Horse Nails, 1 case Oil Stones, 1 case Rakes, 1 case Scythe Snaths, 6 cases Wringers, 3 cases Bolts, 1 case Hardware, 16 packages Hardware, 240 reels Barb Wire, 6 cases Seed Sowers, 1 case Cages, 10 cases Wringers, 6 cases Tools, 2 cases Hardware, 3 cases Hardware, 1 crate Rat Traps, 1 case Tools, 2 cases Bolts.

FOR AUCKLAND.

By Atlas Tack Corporation.—4 cases Nails.
By G. B. Nicholson.—6 packages Tinware.
By E. H. Patterson.—1 case Hatchets.
By W. H. Crossman & Bro.—15 packages Lamp Goods.
By F. B. Wheeler Company.—6 packages Tinware.
By H. W. Peabody & Co.—11 packages Hardware, 14 packages Lampware, 33 packages Lawn Mowers, 1 case Nails, 27 Packages Hardware, 5 cases Traps, 8 cases Horse Nails, 5 cases Bolts, 15 packages Lampware, 3 cases Scales, 1 case Bolts, 5 packages Hardware.

FOR LYTTLETON.

By R. W. Forbes & Son.—14 cases Axes, 3 cases Tinware, 1 case Hammers, 20 boxes Axes, 2 cases Saws, 1 case Hammers.
By H. W. Peabody & Co.—3 cases Tools, 20 cases Hardware, 20 cases Horse Nails, 15 cases Hardware, 1 case Nails, 142 packages Lawn Mowers, 15 packages Hardware, 6 cases Wringers, 1 case Cutlery, 25 cases Lawn Mowers.

THE H. M. MYERS COMPANY, Beaver Falls, Pa., are distributing among the Hardware trade a combined Paper Weight and Pen Rest. The design is a *fac-simile* in miniature of the blank from which they roll their one-piece solid steel shovels. The blade and straps are made from one solid piece of steel, without weld or rivet, and the blades are rolled with a thick center, graduating toward the edges and point, which compensates for the wearing away the back of the shovel when used, the tool, it is stated, retaining its perfect shape until completely worn out. The company advise us that they sold last year half a million of these shovels, and that the last month was the largest in the history of their business, they having made over 5000 dozen shovels.

THE BRONSON SUPPLY COMPANY, Cleveland, Ohio, and 72 Beekman street, New York, advise us that while they have built up an excellent trade on their riveted handle Never Break Wrought Steel Spiders, that trade has been so much exceeded by their newer solid cold-handle mirror polished Never Break Steel Spider as to warrant the company in turning all their Spider machinery on to the solid cold-handle Spiders and discontinuing the manufacture of the riveted handle Spiders altogether. The company also state that they are increasing their manufacturing capacity and hope to be able to fill all orders with reasonable promptness.

WE ARE ADVISED by F. E. Kohler & Co., Canton, Ohio, that they have recently filed a complaint in the United States Circuit Court to prevent the sale of Spring Curry Combs, which are referred to as infringing their letters patent, October 28, 1879.

A DISASTROUS FIRE occurred at the Richardson Saw Works, Newark, N. J., on the afternoon of April 4. The fire took place in the tempering department of the works. The damage done is estimated at $10,000, but we are advised that the delay caused by the fire will be slight.

HARDWARE.

Condition of Trade.

WITH THE ADVANCE of the season and the coming of spring weather an improvement in business is reported in many parts of the country, and there is unquestionably a somewhat quickened demand. The effect of storms in some sections has been felt, and Southern business generally remains without marked improvement, but on the whole the market is more active. A large number of orders are being sent in by the representatives of jobbing and manufacturing concerns, but these are for the most part moderate in volume, covering goods which are necessary to complete stocks for spring trade. The local trade of New York City is only fair, and some disappointment is expressed that the demand is not more active. In the matter of prices there is little new to report. The changes which have taken place during the week are noticed in the following columns, but there is nothing special in the way of improvement in the market's tone, prices, as a rule, continuing low, and owing to the condition of the iron market without indications of recovering strength. The trade generally recognize this condition of things and are purchasing carefully. Collections are fair and there seems to be little ground for complaint. The state of business in the different markets is described in the advices which follow from our special correspondents in the principal centers:

Chicago.

(*By Telegraph.*)

Shelf Hardware Jobbers are having a very good trade, with some houses reporting about all they can conveniently handle. Staple goods are going fairly well, nearly every order carrying some Nails or Barb Wire, especially the latter. There seems to be a total absence of any speculative demand, the low prices at which goods are selling failing to tempt merchants to anticipate their wants. Orders are consequently more numerous, while smaller than is usually the case at this season. Builders' Hardware is in very good demand and Tinware and House-Furnishing goods generally are moving very freely. Mechanics' Tools and Gardening Implements are called for in good quantities. Jobbers complain of the narrowness of margins, which is due to the drooping prices of raw material affecting the whole line. The trade lacks the snap which accompanies firm prices and the certainty of a solid basis to values. The Heavy Hardware trade keeps up very well, but shipments are now more promptly made, which indicates that the rush is about over.

St. Louis.

(*By Telegraph.*)

The extremely stormy weather prevailing throughout the entire West during the past week has interfered somewhat with the volume of trade. Wire Nails and Barb Wire are both weak, and prices of both commodities have been reduced. Spring trade is opening up in good shape and the demand promises to be large. The advance in Brass and Copper goods is maintained, but outside of this the disposition seems to be toward lower prices. Shelf Hardware is in good demand, and building tools and supplies are selling in large quantities. The Southern trade is dull and jobbers are giving the West and Northwest the most of their attention just at present. Money is easy and collections good.

New Orleans.

A. BALDWIN & CO., LIMITED.—The situation in this section of the country shows a slight improvement since our last report. Orders are being received pretty freely, and owing to the low figure at which freight is being taken to Texas points, it has caused a large amount of trade to spring up between the two points, especially on Heavy Hardware and Staples. Buyers were evidently carrying a much reduced stock and are taking advantage of this low freight to replace the same for their spring and summer business.

Barb Wire and Nails are moving in fair quantities, which, perhaps, is improved somewhat by the low price.

Orders for Shelf Hardware also show an improvement, as the demand is for a slightly better grade of goods than was formerly used, as the tendency seemed to o be to get the cheapest grade of goods, no matter of what quality, so long as it came within the limit that they cared to expend on this Hardware.

Cleveland.

THE W. BINGHAM COMPANY.—Business for March is satisfactory as to volume, but prices show somewhat of a weakness. The sharp advance in Copper has strengthened the prices on goods of which it is a component part, but other staples show no signs of immediate improvement. The demand for Nails has somewhat fallen off, but prices as adopted by the manufacturers are being well maintained. Wire is in good demand; prices have fallen off a peg or two. The mail-order business is larger than usual, showing that the stocks over the country are light. The building outlook for the city is good, as there is an immense amount of building going on and also in the hands of architects. The retailers report an improved business. Collections are fair.

Louisville.

W. B. BELKNAP & CO.—There has been only a fair business done for the month just closed. The unseasonably cold weather and deep snows over this and the territory further south, coupled with abominable roads everywhere, into whose muddy depths wagons were only prevented from sinking by reason of their large projecting hubs—all these have conspired to repress any overt enthusiasm which might have been saved up for the calendar spring. Now that March has made its lamb-like exit, however, and the thermometer has jumped from the 20's into the 70's, there is quite a movement manifest along the line, and construction both in town and in the country is proceeding at an encouraging rate. There is more or less hesitating and halting, however, on the part of buyers. The agitation of the silver question is charged with much of the distrust which is keeping capital locked up and cautious, but now that that is happily out of the way, for the time being at least, we have no doubt that since the Bering Sea dispute and tariff can hardly be expected to do full duty, the presidential year will be pleaded as an excuse by those who are averse to paying promptly or who are not given to overexertion in any form. We are told by way of comfort that there is a "better feeling," first in this and then in that article, but "feeling" is as far as it goes. We walk by faith, not by sight. The local Dun's agency report shows business in a healthy condition here. While failures of the first quarter of '92 are almost as numerous as for '91, the liabilities are less than one third as great. If wealth is flocking to cities, it is also being expended in them. There is much new work mapped out here in the way of street improvement, sewers, buildings, &c. Altogether we shall expect to do our fair stint of work this season, besides casting a vote for the next President.

Omaha.

LEE-CLARKE-ANDREESEN HARDWARE COMPANY.—Reports of the condition of Omaha's jobbing trade continue most favorable. There has been a marked and steady increase in the volume of business since January 1, each month showing a large gain over corresponding period of last year, and the total to date scoring a lead of 40 to 50 per cent. over previous seasons. Not only is the present very gratifying in a business way, but the outlook is equally pleasing. There are still large quantities of farm produce held in the farmers' hands, which will be thrown upon the market later in the spring, and thus keep up the supply of money in the country. To supplement this, if there should be another good crop the coming season, the range of business in this section would be something enormous, and would tax the capacity of our jobbing trade to

its utmost. Prices on all leading goods remain remarkably steady. A local temporary cut in price of Wire Cloth, caused by the invasion of the territory tributary to this market by outsiders, is the only feature worthy of note.

St. Paul.

FARWELL, OZMUN, KIRK & CO.—We have little that is new to chronicle. Spring is at hand and the trade shows not only that the backbone of our winter is broken, but that summer is in sight. All lines of jobbing trade are reasonably active and the demand for seasonable goods in all lines of Hardware is satisfactory. The volume of March business is, doubtless, satisfactory to the Hardware jobbers in this section. Prices on Barb Wire, Nails and some other staples are not so satisfactory, the market showing decided signs of weakening. There is less strength in the prices of these staples than the trade expected and the business in this line is not satisfactory. The jobbing trade will buy only for actual wants from now till navigation opens, as the latter feature will have a good deal to do with prices in the early summer. Collections have not been so satisfactory as has been the volume of trade. The farmers have not marketed large quantities of grain during the month and prices are considerably lower, so that the amount of money put into circulation from the sale of grain is not very large, and, as seeding will be the first and most important work throughout the whole Northwest during this month and early May, collections will probably be somewhat slow till early summer, when it is expected they will materially improve. There have been but few failures thus far this year, considerably fewer than usual, and trade is being carried on with less risk than has generally been the case in this region.

Boston.

BIGELOW & DOWSE.—March shows the usual volume of business, and April commences with good prospects for both the wholesale as well as for the retail dealers. Many of the larger contractors have little work on hand in the cities, but out of town in many sections there is the usual amount of building, so that the mechanics are generally employed. Warm weather makes a good demand for farming tools and gives life to general business. Prices show but few changes, and while everything is very low, there is not the usual amount of "cutting" at this season. Wire Nails are weak, and the reduction in freight rates are more than discounted in the present selling prices. The late advance by the Atlas Tack Company is being well maintained. Screws are weak, and jobbers are selling as low or lower than they can replace their stock. The Bicycle craze is at its hight, and many of the Hardware dealers find profit in adding this line to their stock. The Cutlery business of New England for several years has been given up by the Hardware dealers to the manufacturers, but of late the Hardware trade are giving this line most careful attention, and are now carrying large and well-assorted stocks and are regaining their old prestige. Their efforts are meeting with encouragement from the retail dealers, who feel it more convenient to order this line with their other goods, and particularly so when they find they can save money by doing so. The prospects are for a good spring trade.

Portland, Ore.

FOSTER & ROBERTSON.—Trade for the month just drawing to a close has been quite fairly satisfactory, exceeding in volume that of February, 1890, and fully equal to that of 1891. The movement of goods has been very general along the entire line, except perhaps in loggers' supplies, which, owing to the continued dullness in the lumber market, have not moved quite as actively as usual. Orders have not been large, but have been numerous, indicating that buyers are pursuing a careful, judicious course, which in the end must result to the advantage of all concerned. Collections still continue sluggish, with no probability of any improvement soon; certainly not until the farmers are again in possession of something to sell.

Baltimore.

CARLIN & FULTON.—The month of March having passed with its snow and rain, its sleet and ice, we may now look for a most decided improvement in business just as soon as the warm sunshine can dry up the country roads, which, when not macadamized, are almost without bottom; in fact, the influence of the few bright and pleasant days we have recently had has already been most beneficial, and we think it very probable that vegetation and trade will spring into full and vigorous life together almost before we realize it. From the South we never expect much trade at this time of the year, the orders of that section being generally for a few of the leading staples. While of course the low price of cotton still depresses general business in that section, the marketing of early vegetables and fruits will put some cash in circulation, and as there have been large crops of corn carried over from last season, and naval stores, lumber and rice have not suffered the declines in value proportioned to the cotton crop, we think that the dullness of trade throughout that section cannot be of longer duration than the coming summer. Free silver coinage being a question for the distant future, the only immediate drawback to business is the superstition, that the year for a Presidential election must necessarily be a poor one for business, and a great many do not see the difference between a coincidence and a cause. Unless with the advent of a new administration comes a great change in the legislative branch of the Government, introducing new theories and methods of taxation and finance, which is seldom the case, we cannot see why trade generally should be influenced to a state of depression. Whether the Presidential chair be occupied by a Democrat or Republican, the farmer plows just as many acres, the mechanic saws just as many boards, the nation requires the same amount of clothing, and there are just as many mouths to be fed; but the trouble is that as we have always thought that the election year has been a dull one it must necessarily always be. Collections are fair; possibly they will average as well as at any comparative season of previous years. Prices continue low, and the bale of cotton and bushel of wheat have never probably been able to get as much Hardware in exchange for their own values as at the present day.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Trade shows visible signs of improvement. The prolonged winter and lingering cold weather of March aided the tendency of conservative buying which has prevailed during the first three months of the year. Recently, in some sections, there has been complaint of bad roads, which has prevented the farmers entering the buying centers, but with the advent of warmer weather there is more of a disposition shown by the interior merchants to replenish their depleted stocks of goods. There is something exhilarating to the merchant in the advent of spring, when his front doors can be thrown open and goods displayed. These displayed goods, especially for spring wants, are usually reminders to the passer of needed wants. Besides, signs of activity are also contagious to the buyer. This is quite noticeable in the number of letters, postal notes and telegrams urging forward orders that were given early in the season for future shipment to go forward from the middle of April to May 1, but now are demanded immediately. Customers hardly realize, however, that in many instances it is impossible to comply from the fact that of late years it has been the custom for manufacturers to regulate themselves and their business according to the orders they have on hand, especially on season goods, like Agricultural Implements and Poultry Netting, which require a large amount of room for their overstock should they stack it up in advance of requirements and shipments. It is therefore naturally impossible to ship on 24 hours, notice goods that were ordered to go forward 30 days later, yet it is difficult to have the country merchant understand this at the time he gives his orders. Should the present warm weather continue there will naturally be considerable disappointments at delays, and the merchant will think it the fault of the shipper.

We do not agree with the frequent reports which may be read in the daily papers that trade, as a rule, exceeds that of 1891. We think the desire is father to the thought. There has been a feeling of insecurity as to the future of values that has restricted operations. Especially has it been the case with building operations and proposed new enterprises. The silver agitation in Congress has had a most depressing effect upon the country. The rash experiment of trying to legalize and force upon the country 80 cents' worth of silver at $1.20, would naturally enrich a few, but it is looked upon by one faction of the party advocating it as a scheme

for electioneering supremacy. The speculative character, desire and intention of the movement are illustrated by the reports from the silver-mining districts of the closing of several of the silver mines, where it was hoped, by the passage of the bill, to add 50 per cent. to the present price that silver is now sold in the open market. Had there been a wholesome desire to benefit the country it would hardly be upon the plan which would raise the value on over $3,000,000,000 worth of foreign silver, which would naturally be thrown upon our market at an advance of 50 per cent. over its present value. If the efforts of Congress had been toward procuring the co-operation of European nations in the rehabilitation of silver instead of keeping the country in this uncertainty, the effect would likely have been beneficial. From all appearances, the present prices of Hardware are likely to be maintained. The present low ruling prices on Pig Iron are confined largely to Common Foundry Pig Iron, and not likely to affect the price of Shelf Hardware, and the strenuous effort to reduce the wages of those engaged in this line will not likely be successful this season. It is gratifying to see there is a reduced number of business failures during the last two months. Collections are not voluntarily made as promptly as would be desired.

San Francisco.

HUNTINGTON - HOPKINS COMPANY. — The rains this season have come so gradually and at such regular intervals that the crops throughout the State are in the best possible condition, and California has a fine prospect for a golden year. This is a much larger State than the present population can properly care for, and a large increase in immigration would be mutually beneficial to the new and older settlers.

Business has improved very perceptibly over that of last month; prices, however, are about the same. At a meeting of the Barb Wire representatives and the trade, held March 10, the following scale of prices was adopted:

Two or Four Point Galvanized.

	Less than 1 ton.	1 to 10 tons.	10 tons.
W. & M. Mfg. Co.s.	4¾c.	4½c.	4¼c. per lb.
Other kinds	4½c.	4¾c.	4½c. per lb.

Painted, ½c. per lb. less than Galvanized.

As predicted in our last, collections have not materially improved.

Notes on Prices.

Cut Nails.—The improvement noted in our last issue in the Eastern Nail market still continues, and the prices then mentioned are regularly maintained. For both Steel and Iron Nails the market may be described as in a somewhat better condition than for some time. The lowest prices now ruling are in the West, the understanding reached by the Eastern mills being well maintained. This is on the basis of $1.55 for Steel Nails in round lots at mill with 25 or 30 cent average, Iron Nails being sold at 3 cents per keg less. On orders of 1000 kegs or more a concession of 5 cents is made on the above prices. There is also an understanding by which mills will equalize freights with each other. The quotation for small lots from store in New York is $1.75 and carloads on dock are held at $1.65. As intimated above, lower prices prevail in the West and $1.45 to $1.50 may be named as the carload price at the mill.

Chicago, by telegraph.—Steel Cut Nails have not been the subject of much discussion. Manufacturers appear to have established a firm rate here of $1.60 to $1.65 on 30-cent average. Jobbers quote $1.70 for small lots.

Wire Nails.—The Wire-nail market is in an unsatisfactory condition, and lower prices are obtainable than were within the reach of buyers a week or two ago. The manufacturers at their late meeting made an effort to better the situation, but without success, and there has been a slight relapse in prices; $1.65 is now offered by some leading mills for round lots at factory, and rumors are current that this price may be slightly shaded.

Chicago by Telegraph.—The Wire-Nail situation is uncertain. Manufacturers met last week and attempted to advance prices 5 cents, but there are rumors that the agreement is not being maintained by one or two large concerns. The truth of this rumor is the subject of investigation here and if found correct there will be a sudden termination of the understanding, with the usual result. The manufacturers' price agreed upon is $1.90, Chicago, but the jobbers have not changed their quotation of $1.90 for small lots and $1.85 for carloads. $2.70 for carload lots of Four-Point Galvanized at mill fairly represents the market. New York prices for local trade, which are reported to be well maintained, are on a basis of $3.10 for small lots, with 10 cents off for carloads.

Chicago by Telegraph.—The manufacturers are so busy that they have fallen behind in their deliveries, yet reports of weakness in price are as current as when they were eagerly hunting business. Carload lots of Painted are quoted $2.35 to $2.40, and Galvanized $2.80 to $2.90, but large buyers can easily shade these figures. Jobbers quote small lots of Painted at $2.50, and Galvanized $3, and report their sales steadily increasing as the spring advances.

Tacks.—There has for a long time been a perplexing lack of uniformity in the market prices for Tacks, Nails, &c., tending to make business annoying and unsatisfactory to merchants and manufacturers. With a view to correcting this condition of things Atlas Tack Corporation, 508 Sears Building, Boston, have withdrawn previous prices and announce new discounts as per advices given below. The list prices of Tacks, Brads, &c., October, 19, 1889, continue without change, but a new discount sheet dated April, 1892, is issued giving revised discounts. On the entire line of Hardware list goods, papered, dozened and M's, their Class A discounts (for Dunbar, Hobart & Co.'s, A. Field & Sons, and American Tack Company's brands) are as follows:

Goods. Papered, dozened and M's.	Straight weights. *	Star weights. * *	Standard weights. * * *	Special weights. * * * *
Amer. Carpet Tacks, Blued	72½ %	5 per cent. extra list discount beyond straight weights.	10 and 5 per cent. extra list discount beyond straight weights.	10 and 10 per cent. extra list discount beyond straight weights.
" " " Tinned and Coppered	75 %			
Steel Carpet Tacks, Bright and Blued	72½ %			
" " " Tinned and Coppered	75 %			
Swedes Iron Carpet Tacks, S. S., Blued	75 %			
" " " " S. S., Tinned	78 %			
" " " " Lanc., Blued	60 %			
" " " " Lanc., Tinned	67½ %			
American Iron Tacks, Domestic	72½ %			
" " " Foreign	71 %			
Swedes Iron Tacks, S. S., Blued	71 %			
" " " S. S., Tinned	74 %			
" " " Lanc., Blued	60 %			
" " " Lanc, Tinned	63½ %			
Swedes Iron Upholsterers' Tacks, S. S.	74 %			
" " " " Lanc.	63½ %			
Gimp and Lace Tacks, S. S., Blued	67½ %			
" " " S. S., Tinned	71 %			
" " " Lanc., Blued	60 %			
" " " Lanc., Tinned	63½ %			
Basket and Trimmers' Tacks, Lanc.	61½ %			
" " " S. S.	69½ %			
Hungarian Nails	63½ %			
Common and Patent Brads	60 %			
Leathered Tacks	20 %			
Brush Tacks, S. S.	63½ %	These are not packed in other weights.		
" " Lanc.	52 %			
Looking Glass Tacks, Lanc.	35 %			
" " " S. S.	36 %			
Picture Frame Points, S. S.	43½ %			
" " " Lanc.	27½ %			

Barb Wire.—Some of the leading makers are well supplied with orders and are not as anxious as recently for business. Their prices are accordingly a shade firmer. Other mills are, however, quoting prices a slight concession on figures which they have until recently been naming, and on the whole there is little change in the general situation. As a quotation

Pounds, Pound or Half-Pound Papers or Bulk.

	Per cent.
Sweedes Iron Tacks, Lanc., Blued	63½
" " Tinned	67½
" S. S., Blued	72½
" " Tinned	75
Gimp and Lace Tacks, Lanc., Blued	60
" " Tinned	63½
" S. S., Blued	67½
" " Tinned	71
Basket and Trimmers' Tacks, Lanc.	61½
" " S. S.	69½

Steel Carpet Tacks, Blued	77
" " Tinned or Coppered	80
American Cut Tacks, Bulk, Domestic	77
" " " Foreign	74
Swedes Iron Upholsterers' Tacks, S. S.	75
" " " " Lanc.	63⅓
Finishing Nails	63⅓
Trunk and Clout Nails, Black	67½
" " Tinned or Copper	71
Hungarian Nails	63⅓
Basket Nails	61⅓
Chair Nails	56½
Cigar Box Nails	52
Tin-Capped Nails	50
American Carpet Tacks, Blued	77
" " " Coppered or Tinned	80
Swedes Carpet Tacks, S. S., Blued	75
" " " " Coppered or Tinned	78
Swedes Carpet Tacks, Lanc., Blued	60
" " Tinned	67½
Railroad and Bill Posters' Tacks, S. S.	74
" " " Lanc.	60
Leathered Tacks	20

For Nails, dozened, in ½-pound papers, add 1 cent per pound to list.

The list prices of American Iron Tacks, in bulk, are same as the list prices of Swedes Iron Tacks, in bulk, of corresponding sizes.

Net list prices not subject to any list discount, except as below:

Hungarian Nails.

Dozened,	1	1½	2	2½ lb to a doz.
Round Heads,	13	13½	15	17½ cts. per doz
Dozened,	2½	2¾	3	6 lb to a doz.
Round Heads,	20	20½	21½	42¾ cts. per doz
Dozened	1	1½	2	2½ lb to a doz.
Shot Heads..	14¼	15	16¾	19 cts. per doz.
Dozened	2½	2¾	3	6 lb to a doz.
Shot Heads..	21½	22¾	23	44¼ cts. per doz.

Miners' Tacks, 4-8 and longer....8 cts. per lb.
Hob Nails, all sizes.....8 cts. per lb.

Under the heading, "Class B list discounts," the discount sheet states that Loring & Parks' and Taunton Tack Company's brands are subject to an additional list discount of 5 per cent.

The above revised discounts and the Shoe Finders' price-list given below as announced in a circular, April 4, are subject to an additional discount of 25 per cent., terms net cash 30 days from date of invoice, with an additional 2 per cent. for cash in 10 days. Freight will be prepoid or the actual cost of delivery will be allowed on goods in quantities of 300 pounds or more to Boston, New York, Philadelphia, Baltimore and to the principal points on or east of the Mississippi River.

SHOE FINDERS' LIST.

The Atlas Tack Corporation also issue new prices of Shoe finders' goods as shown in E2 and W2 Shoe Finders' lists. The former is applicable exclusively to points east of the Allegheny Mountains and the latter exclusively to points west of the Allegheny Mountains. These lists, except in the prices of Shoe Nails, as more particularly noted below, are identical. The E2 list (for points east of the Allegheny Mountains) is as follows, subject to a discount of 25 per cent., net cash, 30 days from date of invoice, with 2 per cent. discount for cash in 10 days:

	Per 100 lbs.
Iron Shoe Nails, 4-8 inch and longer, No. 15 and thicker, bulk	$4.87
Iron Shoe Nails, 3½-8 inch and shorter, No. 15 and thicker, bulk	5.62
Iron Shoe Nails, 4-8 inch, No. 16, bulk	5.02
Iron Shoe Nails, 3-8 and 3½-8 inch, No. 16, bulk	5.77
Iron Shoe Nails, 4-8 inch and longer, No. 17 and thinner, bulk	6.00
Iron Shoe Nails, 3½-8 inch and shorter, No. 17 and thinner, bulk	6.75
Iron Shoe Nails, in pound papers, add 30 cents list per 100 pounds to above.	
Iron Shoe Nails, in ½-pound papers, add 45 cents list per 100 pounds to above.	
S. S. Shoe Nails, 4-8 inch and longer, No. 16 and thicker, bulk	5.25
S. S. Shoe Nails, 4-8 inch and longer, No. 17 and thinner, bulk	6.37
S. S. Shoe Nails, add 37½ cents list per 100 pounds for papered.	
Best Swedes and Russia Iron Nails, 4-8 inch, No. 16 and larger	9.00
Zinc Shoe Nails, 4-8 inch and longer	12.00
" " " 3½-8 inch and shorter	12.75
Zinc Shank Nails, 4-8 inch, No. 16 and larger	13.65

Diamond Head Zinc Nails:

2-8 & 2½-8 in.	3-8 in.
Per 100 pounds....$26.25	22.05

3½-8 in. and longer. Per 100 lbs.
Diamond Head Zinc Nails.....$17.85
Copper Shoe Nails.....37.50
Brass Shoe Nails.....30.00
Copper Gimp Nails.....42.00
Brass Gimp Nails.....37.50
Copper Shank Nails.....37.50

	Bulk and lb pps.	½-lb pps.	¼-lb pps.
American Iron Hungarian Nails:			
Gauge 12 and 13, 2½-8 and shorter	$8.25	$8.40	$8.62
Gauge 12 and 13, ⅝	7.12	7.27	7.50
Gauge 12 and 13, 3½-8 and longer	6.37	6.52	6.75
Gauge 13½ to 15, 2½-8 and shorter	9.00	9.15	9.37
Gauge 13½ to 15, ⅝	7.87	8.02	8.25
Gauge 13½ to 15, 3½-8 and longer	7.12	7.27	7.50

—Per 100 pounds.—

	2-8 and 2½-8 in.	3½-8 in. and ⅝ in. longer.
Swedes Iron Hungarian Nails:		
Gauge 13½ to 15	$11.34	$9.45 $8.50
Gauge 12 and 13	....	8.50 7.56
Swedes Fancy Head Hungarian Nails	18.90	16.80 15.75
Tinned Swedes Fancy Head Hungarian Nails	22.05	19.95 18.90
Oval Head Shank Nails or Tacks	24.00	16.80 10.80

Hob Nails, Swedes Iron, all sizes, 9 cents per pound, in pound or ½-pound papers.
Hob Nails, American Iron, all sizes, 6⅝ cents per pound, in pound or ½-pound papers.

Steel Shoe Nails.

2-8 & 2½-8 in.	3-8 & 3½-8 in.	4-8 in. and longer,
12	10½	9 cts. per lb. in pound or ½ pound papers.

4-8 in. shorter and 5-8 in.	6-8 in. and longer.
14¼	16½ 18 cts. per M.

Channel Nails.....2½-8 in. ⅝ in.
24 19½ cts. per lb.

Channel Nails.....3½-8 in. 4-8 in.
14¼ 12 cts per lb.

Channel Nails.....4½-8 in. 5-8 in. and longer.
11¼ 9¾ cts. per lb.

Cents per M.

Swedes Iron Shoe Tacks	½ oz. 2¼	¾ oz. 2¼	1 oz. 2¼
Swedes Iron Shoe Tacks	1¼ oz. 2¼	1½ oz. 2¼	2 oz. 2¼
Swedes Iron Shoe Tacks	2½ oz. 2¼	3 oz. 2⅝	4 oz. 3

Cents. per pound.

Swedes Iron Shoe, Lanc.	½ oz. 36	¾ oz. 25	1 oz. 20
Swedes Iron Shoe, Lanc.	1¼ oz. 18	1½ oz. 16	2 oz. 14½
Swedes Iron Shoe, Lanc.	2½ oz. 13½	3 oz. 13	4 oz. 12
Shoe Tacks, S. S.	½ oz. 33	¾ oz. 24	1 oz. 18
Shoe Tacks, S. S.	1¼ oz. 16½	1½ oz. 15	2 oz. 13½
Shoe Tocks, S. S.	2½ oz. 12⅝	3 oz. 12	4 oz. 11¼

Miners' Tacks, Swedes Iron, Lanc., ⅝ in. 3½-8 in. and longer. 13½ 10⅝ cts. per lb.

Miners' Tacks, American Iron, ⅝ in. 3½-8 in. and longer. 9 7½ cts. per lb.

Rubber Sole Nails	⅝ in. 18	3½-8 in. 15¾ cts. per lb.
Rubber Sole Nails	4 8 & 4½-8 in. 11¼ cts. per lb.	
Rubber Sole Nails	⅝ in. 10½ cts. per lb.	
Sole Tacks	3-8 in. 18	3½-8 in. 15¾ cts. per lb.
Sole Tacks	4-8 & 4½-8 in. 11¼	5-8 in. and longer. 10½ cts. per lb.

Countersunk Swedes Shoe Nails, 3-8 in. 18 — 3½-8 in. 15¾ cts. per lb.

Countersunk Swedes Shoe Nails, 4-8 & 4½-8 in. 11¼ — 5-8 in. and longer. 10½ cts. per lb.

Checkered Head Countersunk Nails, all sizes, 15 cents per pound.

Fancy Head Patent Corrugated Countersunk Swedes Last Nails, all sizes, 15 cents per pound.

C. S. Corrugated Brass Nails or Flat Head Improv'd Brass Nails...	2-8 & 2½-8 in. 34½ cts.	3-8 & 3½-8 in. 28½ cts.
	4-8 in. and longer. 27 cts. per lb.	

Concave and Countersunk Head Copper Nails, all sizes, 34½ cents per pound.

	2½-8 in.	⅝ in.	3½-8 in.
Iron Gimp Nails..	48½	33½	30½
	4-8 in.	4½ 8 in.	⅝ in.
Iron Gimp Nails..	25	23	21
	5½-8 in.	6-8 in. and longer.	
Iron Gimp Nails..	20	19 cts. per lb.	

Swedes Slivers, pounds, all sizes, at 10½ cents per pound.

Brass Channel Nails, at 31½ cents per pound.

Iron Screw Head Nails, plain shanks, at $18.90 per 100 pounds.

Iron Screw Head Nails, corrugated shanks, at $21 per 100 pounds.

Iron Screw Head Nails, corrugated shanks, at 5¼ cents per paper (75 Nails).

Iron Countersunk Nails—

4-8in.	5-8in.	6-8in.	7-8in.	8-8in. long.
3¼	3½	3⅝	4	4¼c. per pa., 75 nails.

Round Screw Head Nails—

9½	10½	11½	12½	13½c. " 120 nails.

Round Scr. Hd. Nails, Tin'd—

11½	12½	13½	15¾	17c. " "

Brass Screw Head Nails, plain shanks, at 42c. per lb.

Brass Screw Head Nails, corrugated shanks, at 44c. per lb.

Brass Screw Head Nails, corrugated shanks, at 11½c. per paper (75 nails).

EXTRAS.

For 17-gauge Zinc shank Nails, add 1 cent per pound to list.

For 3-8 and 3½-8 Zinc Shank Nails, add 1 cent per pound to list.

Any of the above kinds, Tinned or Copper plated, price not specified, 3½ cents per pound advance on above prices.

Strapping boxes 10 cents each.

The list for trade west of the Allegheny Mountains (W2) gives the following prices of Shoe Nails, which are different from those named above, the list being in other respects the same:

	Per 100 lbs.
Iron Shoe Nails, 4-8 inch and longer, No. 15 and thicker, bulk	$5.25
Iron Shoe Nails, 3½-8 inch and shorter, No. 15 and thicker, bulk	6.00
Iron Shoe Nails, 4-8 inch, No. 16, bulk	5.40
Iron Shoe Nails, ⅝ and 3½-8 inch, No. 16, bulk	6.15
Iron Shoe Nails, 4-8 inch and longer, No. 17 and thinner, bulk	6.37
Iron Shoe Nails, 3½-8 inch and shorter, No. 17 and thinner, bulk	7.12
Iron Shoe Nails, in pound papers, add 30 cents list per 100 pounds to above.	
Iron Shoe Nails, in ½ pound papers, add 45 cents list per 100 pounds to above.	
S. S. Shoe Nails, 4-8 inch and longer, No. 16 and thicker, bulk	5.62
S. S. Shoe Nails, 4-8 inch and longer, No. 17 and and thinner, bulk	6.75
S. S. Shoe Nails, add 37½ cents list per 100 pounds for papered.	

The trade who have to suffer most of the inconvenience of the diversity of base discounts on Tacks will appreciate the commendable effort made by the Atlas Tack Corporation to secure more uniformity, and it would be very desirable if in some way there could be a general agreement among manufacturers on this point. The prices announced are, we believe, an effort in this direction. There will, however, be general regret that it was thought necessary to announce such unusual and difficult discounts as 36 per cent., 43½ per cent., 52 per cent., 63½ per cent., 69½ per cent., 71 per cent., &c. While there are certain advantages in having a single discount as the base price, the inconvenience of using such discounts as these would seem to more than counterbalance any advantage which they may possess over simpler discounts which would give practically the same result.

WROUGHT-IRON GOODS.

Price per gross unless otherwise specified. Revised list, March 17, 1892.

Inches	1	1¼	1½	1¾	2	2¼	2½	2¾	3	3½	4	4½	5	5½	6	7	8	9	10	12
STAPLES:																				
Plain	$1.20	$1.20	$1.25	$1.50	$1.70	$2.00	$2.35	$2.65	$3.20	$3.70	$5.25	$6.50	$8.00	....	.....	.....	.....	.....	.....	.....
Japanned	1.40	1.40	1.50	1.75	2.00	2.35	2.75	3.10	3.75	4.35	6.20	7.60	9.00	.....	.....	.....	.....	.....	.....	.....
Galvanized	1.80	2.00	2.25	2.50	3.00	3.50	4.00	5.00	6.00	7.00	9.00	11.00	13.00	.....	.....	.....	.....	.....	.....	.....
EXTRA HEAVY STAPLES:																				
Plain	.....	.....	.....	.....	2.50	.....	3.50	.....	4.80	5.75	8.00	10.00	11.00	.....	14.00	.....	.....	.....	.....	.....
Japanned	.....	.....	.....	.....	3.00	.....	4.25	.....	5.75	7.00	9.50	11.50	13.00	.....	16.00	.....	.....	.....	.....	.....
Galvanized	.....	.....	.....	.....	4.00	.....	6.00	.....	8.00	10.00	13.50	17.00	20.00	.....	23.00	.....	.....	.....	.....	.....
HOOKS AND STAPLES:																				
Plain	.....	.....	.....	.....	7.00	.....	7.50	.....	8.00	9.00	10.00	11.00	12.00	13.00	14 00	22.00	25.00	28 00	33.00	36.00
Japanned	.....	.....	.....	.....	7.50	.....	8.00	.....	9.00	10.50	11.50	13.00	14.00	15.50	16.50	25.00	28.00	.....	.....	.....
Galvanized	.....	.....	.....	.....	9.00	.....	9.50	.....	11.00	12.50	14.50	16.50	17.50	19.50	21.00	30.00	35.00	.....	.....	.....
HOOKS AND STAPLES, EXTRA HEAVY:																				
Plain	.....	.....	.....	.....	.....	.....	8.50	.....	9.75	11.00	13 00	.....	16.00	.....	19.60	.....	.....	.....	.....	.....
Japanned	.....	.....	.....	.....	.....	.....	10.00	.....	11.50	13.00	15.00	.....	18.50	.....	22.50	....	.. ..	... .	.....	.....
Galvanized	.....	.....	.....	.....	.....	.....	12.50	.....	14.50	16.50	18.50	.....	23.00	.....	28.00	.....	.....	.....	.....	.....
HASPS AND STAPLES:																				
Plain, per dozen	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.84	.....	.90	.....	1.00	1.10	1.30	1.70	2.00	2.60
Japanned, per dozen	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.00	.....	1.10	.....	1.20	1.30	1.60	2.00	2.30	3.10
Galvanized, per dozen	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.50	.....	1.60	.....	1.80	2.00	2.50	3.00	3.50	4.50
HASPS AND STAPLES, EXTRA HEAVY:																				
Plain, per dozen	.. ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.36	1.50	1.70	2.00	2.30	3.50
Japanned, per dozen	.....	.....	.....	.....	.....	.....	.....	.....	.....	. ...	.....	.....	.....	.....	1.60	1.75	2.00	2.35	2.70	4.25
Galvanized, per dozen	.....	.. ..	.....	.....	.....	.	.....	.....	.....	.....	.....	.....	.....	.....	2.50	2.75	3.00	3.50	4.00	6 00
HASPS AND STAPLES, WITH HOOK:																				
Plain, per dozen	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.20	.....	1.40	1.60	1.80	2.20	2.50	3.80
Japanned, per dozen	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	. ...	1.40	.....	1.65	1.90	2.10	2.60	3.00	4.54
Galvanized, per dozen	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.25	. ...	2.50	3.00	3.50	4.00	4.50	7.00
HASPS AND STAPLES, WITH HOOK:																				
Extra Heavy, Plain, per dozen	.....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.80	2.00	2.30	2.60	2.90	4.50
Extra Heavy, Japanned, per dozen	.....	.....	.....	.....	.....	.....	.. .	.....	.....	.....	.....	.. ..	.....	.....	2.10	2.35	2.70	3.00	3.40	5.25
Extra Heavy, Galvanized, per dozen	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.50	4.00	4.50	5.00	5.50	8.00
BENT HASPS AND STAPLES:																				
Plain, per dozen	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.10	.....	1.30	1.40	1.60	2.00	2.20	.....
Japanned, per dozen	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.30	.....	1.50	1.60	1.85	2.30	2.50	.....
Galvanized, per dozen	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.75	.....	2.00	2.25	2.50	3.00	4.00	.....
TRAP-DOOR RINGS:																				
Plain	.....	....	8.00	8.75	9.50	11.50	13.00	.....	18.00	.....	.....	.....	.....	.....	.....	.....	.....	. ...	.....	.....
Japanned	.....	.....	9.00	10.00	11.00	13.00	15.00	.....	20.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Galvanized	.....	.....	10.50	11.50	13.00	15.00	18.00	.....	23.00	.....	.....	.....	.....	.....	.....	.. ..	.....	.....	.....	.....
TRAP-DOOR RINGS AND STAPLES:																				
Plain	.....	.....	9.50	10.50	12.00	14.00	15.50	.....	22.00	.....	....	.....	. ...	.....	....	.....	.....	.....	.....	.....
Japanned	.....	.....	11.00	12.00	13.50	16.00	18.00	.....	25 00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Galvanized	.....	.....	12.50	14.00	16.00	19.00	21 00	.....	29.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
S HOOKS:																				
Plain	.....	.....	6.00	6.75	7.25	8.50	9.50	.....	11.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Galvanized	.....	.....	8.00	9.25	10.50	12.00	14.00	.....	16.00	.....	.....	.....	.....	.....	. ...	.....	.....	.....	.....	.....
Blunt Plain	.....	.....	4.00	4 75	5.50	6.50	7.50	8.50	9.50	13.00	.....	.....	.....	.....	.. ..	.....	.....	.. ..	.....	.....
AWNING HOOKS:																				
Plain	.....	.....	6.00	6.00	6.50	.....	7.00	.....	7.50	8.00	9.00	10.00	11.00	12.90	13.00	.....	.....	.....	.....	.....
Galvanized	.....	.....	7.50	7.50	8.00	.....	8.50	.....	9.50	10.50	12.50	14.00	16.00	17.00	18.00	.....	.....	. ...	.....	.....
Round Iron, plain	.....	.....	3 00	3.40	3 60	.....	4.00	.....	5.00	6.0	7.00	8.50	10.00	11.50	14.00	.....	.....	.....	.....	.....
Inches	1	1¼	1½	1¾	2	2¼	2½	2¾	3	3½	4	4½	5	5½	6	7	8	9	10	12

Wrought Goods.—We give above, arranged in tabular form, the present list on Wrought-Iron Goods, embodying the changes which were determined upon by the associated manufacturers March 17. In addition to the goods represented in the table, revised list prices on Meat Hooks were also determined upon. The changes made in these goods were alluded to in our last issue in connection with a reference to Sargent & Co.'s numbers.

Glass.—Up to the time of going to press no returns have been received regarding the results of the meeting of the American Glass Manufacturers, held on the 5th inst. at Chicago. We are therefore unable to state what action, if any, was taken toward an advance in the price of Glass, as this was one of the matters to be taken under consideration at this time. It is understood that the importers of foreign Glass have agreed to advance prices, and that the advance will probably take the shape of a new list. What the per cent. of advance will be as compared with present prices, or when the advance will take place, has not yet been announced. The necessity of some concerted action toward putting prices on a paying basis is evident from the fact that foreign glass is selling down to the price of American, although the latter is considered ruinously low. It is not improbable that the American manufacturers will adopt the new French list, as has been done formerly, although it is stated that the importers are working entirely independent of the American manufacturers in this matter. Trade has shown little or no improvement during the past week, the demand continuing light and prices unsatisfactory. Quotations remain unchanged, as given below: American Window Glass, 1000-box lots or more, 80, 10 and 5 per cent. discount; carloads, 80 and 10 per cent. discount; less than carloads, 80 and 5 per cent. discount; French Window Glass, 75 and 10 per cent. discount; American Plate is held at a discount of 50, 10 and 5 per cent., and imported Plate at a discount of 60 per cent.

Manufacturers and Net Prices.

WE GIVE BELOW extracts from letters received from representative manufacturers in various lines, some of which are directly connected with Hardware and others closely related thereto. It will be observed that in some of the communications our correspondents express a decided preference for net prices, but that the decided preponderance of opinion seems to favor lists and discounts. A good many points of interest are incidentally touched upon. In addition to the letters which follow, we have others, some of which are of special interest, to which we shall have occasion to refer in a subsequent issue:

Hardware Specialties.

In our judgment a general abandonment of lists and discounts is neither practicable nor desirable. Undoubtedly there are some goods which might be sold to better advantage under a system of net prices, but a large proportion of the goods handled by the Hardware trade are made in such a variety of sizes, qualities, &c., that the application of net prices would entail a great amount of labor, expense and vexation, without any compensating advantage. We must confess that it would seem to us impossible for the buyer to keep himself as well posted if goods were sold at net prices as under the discount system, and this is, in our judgment, a very great objection. Intelligent buying is the corner stone of every business, and anything which tends toward that end should be encouraged.

Locks and Shelf Hardware.

We doubt if the adoption of net prices for Hardware, as far as the manufacturer is concerned, is either practicable or desirable. It would be almost impossible to keep jobbers, large retailers and small retailers posted as to changes in prices. Then, again, it would take a salesman representing a large line of Hardware two or three days to price up a dealer and neither one could afford to waste this time. To print these prices would make them too public and likely to get one manufacturer's schedule of prices into the hands of his competitors. We are in favor of list prices and discounts, and special nets to a few favored customers on leaders.

Snaps.

While the adoption of net prices to the exclusion of lists and discounts is practicable, in our opinion it is not desirable for many reasons. One strong reason on which we base our opinion is that the catalogue and price-list of a manufacturer must necessarily go into the hands of both the retail and jobbing trade, and if net prices only are used then comes the necessity of publishing separate catalogues and prices, which, even if the greatest care is used, will create confusion by the trade getting the jobber's prices. We are not in favor of a multiplicity of discounts and have never used them, and find that one simple discount for each trade gives better satisfaction to ourselves and our customers than would many discounts or even net prices. No doubt you will hear from many manufacturers on this subject and we will therefore leave for others to express views that we might here set forth. Perhaps it will be well to state that we are in receipt of letters from heavy jobbers stating their satisfaction at our having but the one simple discount, and commenting on the multiplicity of discounts adopted by other manufacturers of similar goods.

Sporting Goods.

It has been our custom for a number of years past to sell the goods of our manufactures at net prices, and we find that it works to the satisfaction of our customers as well as ourselves, and we feel that our customers are enabled to get a better profit on our goods than if listed with a discount to be taken off. We are firmly of the opinion that this is the proper way to market goods.

Tinware.

We have not given the matter you refer to of adopting net prices in place of price-lists and discounts (as has been in vogue in the Tinware trade for a number of years past) much thought, but from a casual consideration of the matter we are inclined to favor net prices. There are, in our opinion, some difficulties in the way that would be hard to overcome, for the reason that nearly all, if not all, of the Tinware manufacturers sell to the large and small jobbers and in many instances to large retailers, and must necessarily make some difference in the prices to different classes. Every large buyer thinks he is entitled to some special price, and as a rule would not be satisfied to buy from a printed list, knowing that a smaller buyer, either jobber or retailer, would have the same advantage, and as the line of goods is too large to quote net prices by letter, printed lists will be a necessity. It has been our rule for several years past to quote net prices on the leading articles of Pieced Ware and a discount on the general line. This was an advantage until competitors found out just what those net prices were, which could not be kept confidential for any length of time, and the result is that on all such goods the profit is cut to the minimum. As list prices of some kind are a necessity we are in favor of making them practically net, so that to the large buyers, for a stipulated quantity, an extra discount could be allowed, not to exceed 7½ to 12½ per cent. On the other hand, among the evils of high lists and long discounts are these: 1. On the line of Deep Stamped Ware some items cannot be sold by manufacturers at less than 70 and 25 per cent., while others are sold as low as 80 and 15 per cent., and when a buyer wants to make a point he can truthfully say that he can buy Deep Stamped Ware at 80 and 15 or 80 and 5 or 80 per cent., and endeavor to impress upon the salesman that the general line can be bought on that basis. The result is that the overzealous salesmen is at sea and is in wire communication with his house trying his best to meet the views of the customer, and some of the smaller buyers who hear of a discount better than 80 per cent. take it for granted that the entire line can be bought on the same basis, and cannot or will not be convinced to the contrary. It is a very difficult matter for the large jobbers or the manufacturers who sell to the smaller dealers to convince them that this discount applies not to the full line, but only to some specialties. On the whole, therefore, while it will entail upon the manufacturers and also the buyers extra work, we feel that on sales made by the jobbers or to the smaller trade by the manufacturers more profit can be realized by the net price system than the present one of lists and discounts.

Wire Goods.

We should be very glad to learn that a majority of the trade desire the net-price system. We have continued using lists and discounts because we have been under the impression that it accommodated the trade and was more satisfactory. If the net-price system should ever prevail it would be necessary for trade publications to devise some plan for protecting the trade from their customers obtaining the actual cost of goods, which is now satisfactorily overcome by publishing only discounts.

Machine Bolts, &c.

We do not see how it is either desirable or practicable to make net prices on Machine Bolts, Gimlet Point Coach Screws, Set and Cap Screws, Nuts, &c., on account of the great variety of sizes and lengths, for we do not consider it fair either to the consumer or the manufacturer. We could give our reasons at length, but they seem so obvious that we do not do so.

Guns.

We are heartily in accord with net prices. The list-price system has always worked to great disadvantage to Gun manufacturers, and a year ago we adopted the plan of selling all our goods at net prices. The only discount we allow is a cash discount, and find that the plan works admirably.

Screws, Bolts, &c.

Our goods would have to be sold by discount, same as Screws, Carriage Bolts, &c., owing to the great variety of sizes. We do not see how it is possible to sell goods that have a list of from 50 to 75 sizes at net prices. When a buyer has a new price quoted him he has to change his discount only, but, if the goods were sold at net prices, he would have to go through the entire list and change every item.

Plumbers' Goods.

We see no reason why net prices in the Hardware line might not work well, but in our business, when consumers so frequently select goods, it seems to be necessary to have a long and a net price in order to protect the interests of the plumber, and as prices change so frequently we see no better way than the one in present use. The protection to the master mechanic is, however, the only objection we see and if net prices can in any way be utilized to accomplish this object it would simplify office work to an extent that would certainly be desirable.

Specialties.

We are at the present time quoting net prices on our Hardware line and prefer it so, as it covers so many different articles it would be almost impossible to figure a different discount on all of them. On our specialties we generally quote a discount, being of one kind, and we think it easier to bill this way. We have never experienced any trouble with our patrons in either case, but think net prices are preferable.

Oil Stoves.

Our preference is entirely in favor of the net prices, but there is a good deal of difficulty among certain of the trade, who do not seem to comprehend the fact that it is the net result as to prices that they are after, but rather seem to think the bigger the discounts they get the lower they are buying goods; and, unreasonable as it seems, there are many traders who, if they can buy 10 per cent. less in discount than you quote them of some other party, they think they are buying just so much less, although the other party's price may be 25 per cent above the first one. In short, we favor the entire abandonment of long prices with discounts, and substitute therefor net prices. The trade, of course, will have to be educated somewhat, for they believe, as a rule, that no net printed price can be bottom, on account of these many houses in the trade having about as many prices as they have customers, and a sort of vanity that some buyers like to feel that they are purchasing lower than somebody else. Again, a long price, if correctly adjusted, has a tendency to establish retail price, but even this is not possible, as in some parts of the country it costs more to handle the goods, hence they must be retailed at a larger price.

Lawn Mowers.

It seems to us that to abandon discounts from a regular list would necessitate the abandonment of printed lists entirely, and so would largely increase the labor and expense of the manufacturer. We are called upon daily by both jobbers and retailers to quote prices. With the aid of lists we can do this to the satisfaction of both classes, and still leave a fair margin for the jobber beyond the quotation to the retailer. It would be very difficult to make and keep account of a separate price for each of those whose trade might entitle them to a shade of advantage over others. We think, however, that there could be a reform in the matter of placing prices as high as they usually are and making such long lines of discount. If the list prices could be established at about a fair price at which the goods could be retailed, the discounts could then be smaller, and we think it would be better for the jobber and retailer. The effect of the present high list seems to be that it gives the consumer the knowledge that there is a discount, and that it is pretty large. In view of the above, as well as many other reasons, we do not think that the abandonment of list prices is practicable or desirable.

Wagon Hardware.

We, of course, can simply speak from our own point of view, and it seems to us, as far as we are concerned at least, it will be better for us to continue the way we have been doing—that is, allowing discounts from the lists. This at least would be true of Wagon Hardware Department, as there is a very large line of goods and many of them in certain classes which we cannot quote with full discount, whereas if we quoted net prices on each and every size it would be almost an endless job for us to get up price-lists. As we are sending out 2000 or 3000 price-lists every year priced up by hand instead of print you can readily see how much of a job it would be if this list was made some 15 or 20 times larger than it now is by the introduction of net prices instead of discounts. As far as we are concerned, we see no particular object in quoting the net prices, and we know it would make a very much greater amount of work at the office in doing so.

Machine Screws.

We have been satisfied for a long time that the method of quoting prices subject to all manner of discounts is misleading, expensive and cannot be justified on business or economic principles. We would be glad to see the whole network of discounts brushed away so that we could publish to the world a list of prices that could be readily understood and would mean something, which they do not at present. It would be an immense saving of labor in every department in which goods are handled. I know of no more influential medium through which to bring about this desirable change than your valuable publications, which are always read with interest and are usually backed by sound reason.

Freezers.

From our standpoint we do not deem the movement toward net prices on practically all lines of Hardware as possible or even desirable. In our own case, however, it could be done with comparatively little trouble or extra labor, yet if we were to abolish absolutely all lists and quote net prices only, it would not be of any earthly benefit to us in a direct way, but possibly might enable the jobbers to realize a better margin on our goods for a year or two. We do not believe we could get any more money for our goods under the proposed net-price plan than at present, and the jobbers themselves are responsible for their reduced profits—we are not. The movement has been instigated, in our opinion, by the jobbers, and yet they would not be any better satisfied after say two years' trial of net prices than now. Competition would force prices down to just as close a margin under the new plan as the old. We cannot see any direct benefits to be derived by the manufacturers from an abolition of list prices and discounts, yet we do see that it would increase their expenses of marketing their product.

Wire Goods.

We should suppose that abandoning lists and discounts would throw the Hardware trade into such confusion as it would take years to recover from. At present the habit is for manufacturers to conform to a list which all use, and it has come to be settled that there is one, and only one, correct list for any line of staple goods. By quoting a discount upon this list the dealer is able to make himself promptly understood by the buyer. The absence of such a list and discount would make it impossible for us to do business at present, with the immense variety and detail there is to the Hardware trade. The various articles and sizes of articles made by one manufacturer frequently run up into the thousands. The absurdity of attempting to quote prices to a customer, or to keep track of the goods by any other than an established list, seems so apparent as to be beyond argument. In the absence of an established list, if one customer per day were to ask an off hand question like, for instance, "How do you sell Cotter Pins?" it would take the average penman a day to answer his question. If he further made a note of his quotation, for future reference, it would take him another day We can hardly believe that any one seriously proposes such an innovation as the abandonment of lists and discounts. It is so improbable and impossible that we think we misunderstand the real position in dispute.

Whetstones.

In regard to the matter of net prices, we are decidedly in favor of the abandonment of price-lists and discounts and in favor of the substitution of net prices. In our opinion the present system of discounts has done more to demoralize prices and to destroy profits than anything or everything else that has been done to affect the price of goods in the Hardware line. For instance, in our own line, if there is one article which the jobber feels that he ought to buy at a lower price in order to meet certain competition, or for any other reason, and we make a discount to meet that price, the discount very soon applies to our entire line, while if we made a net price we would only have to cut the price on the one article, but the trouble is with American Hardware clerks they have not learned their business, and there are too many items and too much work for them to be-

come fully acquainted, so they know the value of the goods that are sold by them, and if they can take the catalogues of Jones, Brown, Smith or others and simply figure a discount they are all right.

Cutlery.

We think the discussion which you are taking up in your paper in regard to net prices on Hardware is a desirable thing to do. We have always used net prices, except in one or two odd lines, and in our case it has worked well.

Specialties.

We are of the opinion that the present discount system is much better both for the jobber and manufacturer than net prices, and we do not propose to change unless we can see much more clearly than we do at present the advantage of such a move.

Locks.

We favor doing it in the shortest way. Our experience is based on a unique line of specialties in Locks, comprising only about 100 numbers on our list, of which less than 25 are active sellers.

In listing, we endeavored to set prices that would net us alike the same percentage profit, if the goods sold at the full list prices.

But, after manufacturing an assortment for a few years, we find it quite impossible to hold a uniform discount. We find:

(*a*) Variations in the cost of materials.

(*b*) Improvement in processes of manufacture.

(*c*) Large sales of some, and small sales of other numbers; so that the original cost of our leaders has been often reduced, though occasionally actually advanced, not all having been changed in equal proportion.

It is therefore clear that even for a limited line, there must be about as many discounts as there are sorts of goods. In such cases there seems to us no gain in quoting by discount. Again, as manufacturers, we draw sharp lines between jobbers and retailers. The retailer considers the price of each Lock. The jobber sells by the dozen, and therefore considers the price per dozen. Hence we would quote net prices per single, per dozen, per gross, per pound or per ton, as might best suit the grade of the dealer in view. This seems to us as natural as any direct way of communication can be. It saves the mental effort and time required to figure down to the net values. It is the shortest way and the least liable to error.

Tools.

We have lists of all our goods, but very seldom do we quote discount prices. We sell by net prices and consider it a great saving of time and labor, and think it very desirable to substitute net prices for lists and discounts, and believe it practicable as well. It is so with us.

Manufacturer, Jobber and Retailer.

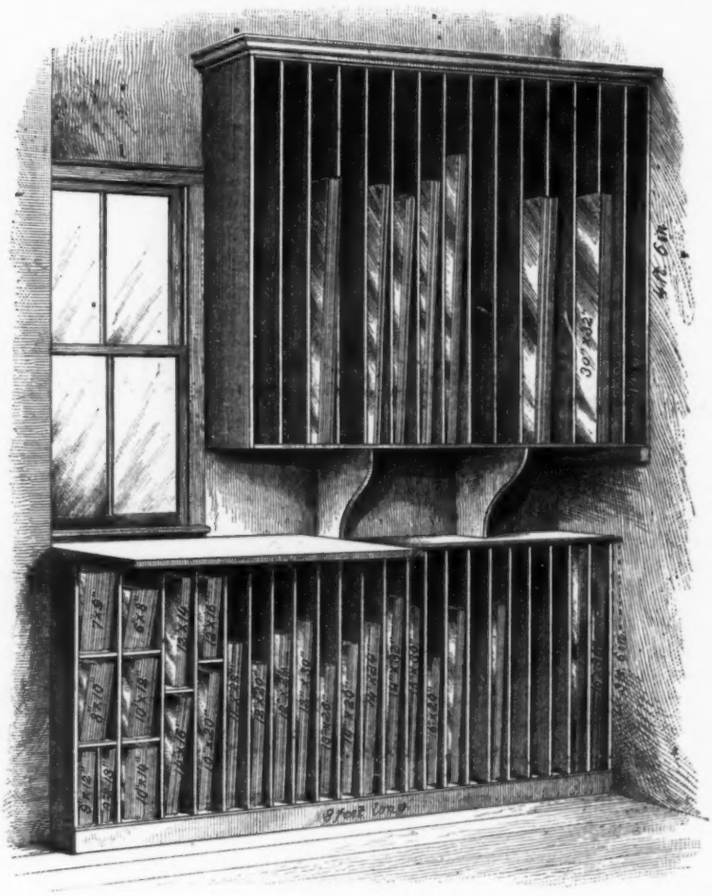
FROM A SPECIAL correspondent familiar with matters concerning which he writes, we have the following communication, in which the relations of manufacturers to jobbers and retailers are touched upon and reference made to the decidedly animated competition which prevails in many lines of trade:

The Hardware trade in general is in a very satisfactory condition. While orders are not crowding the jobbers, yet they aggregate quite a volume, week by week. The country is growing constantly, with new depots for distribution being established, and these new houses are reached direct by the manufacturer more every year; hence, naturally, much of the heavy trade formerly gotten by the jobbers goes direct to the factories. As competition lessens profit, the manufacturer seeks this trade in order to even up some of the losses made in selling the big jobbers, for losses there are on nearly every large contract now made. In fact, it is well known in several leading lines that if a manufacturer can place half of his product with big houses at actual cost he is doing well, and his profits must come from the balance of his output, sold to smaller dealers and consumers. In this way, it is true, the manufacturer and his largest customers often come in competition with each other, but as they are all "out for the stuff," there is no time for quarreling; both push on for the next town. The manufacturer would undoubtedly prefer to sell only to the jobbers if they could handle all their goods to advantage; they realize that the latter class are the natural and proper distributors, but then comes in such sharp competition among the former, such overproduction by increased capacity and double-turn.

The scramble is a prodigious one. Who would have thought ten—yes, five years ago, that nearly all of the valuable Cut Nail plants in the country would be shut up or turned on to some other line of work? Yet such is the case in the West; very few of the great mills centering around Wheeling are making any Nails. The Nail business has been an epitome of the history of nations; the invaders accomplish their purpose, drive out opposition, and then turn to war on each other, and then the competion gets hotter and hotter.

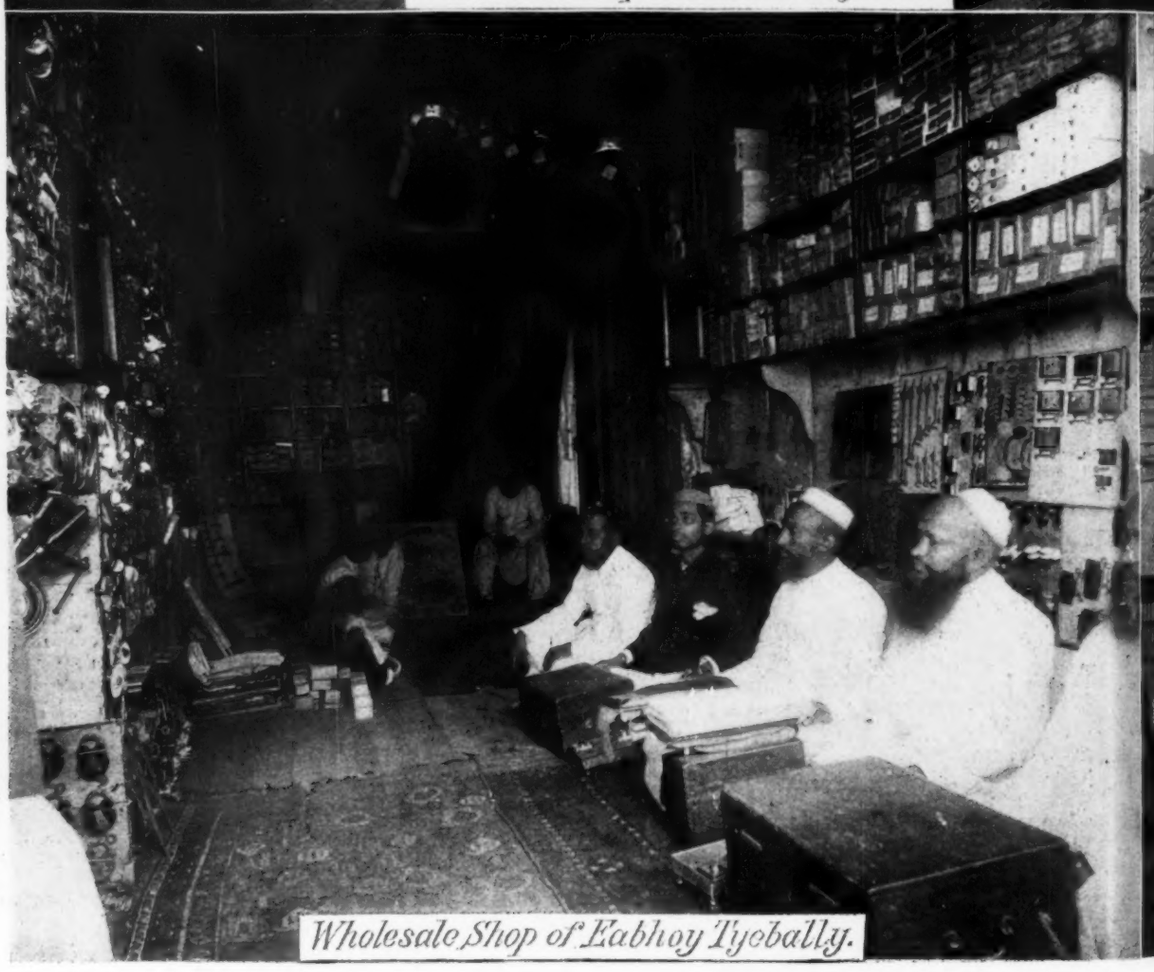
A Glass Rack.

HEREWITH IS GIVEN an illustration of a Glass rack, which is in use by E. E. Norton, Summit, N. J. It is located at the back end of his store, between the wall on one side and a chimney on the other. The window at the right of the chimney furnishes the necessary light by which to cut Glass. The lower part of the rack is 16 inches deep, 8 feet long and 3½ feet high, and is devoted to Glass up to 16 x 36 inches in size. The shelf formed by this part of the rack serves as a place on which odd pieces of cut Glass are laid for future use. The upper part of the rack is 16 inches deep at the end next to the chimney, and widens out to 26 inches at the opposite end. This is divided into spaces 3½ inches wide, and is used for Glass 16 inches wide and longer than 36 inches, up to 34 x 36 inches, which is as large as is carried in stock. The spaces in the lower part, except those used for the smaller sizes of Glass, are 4 inches wide.



A Glass Rack.

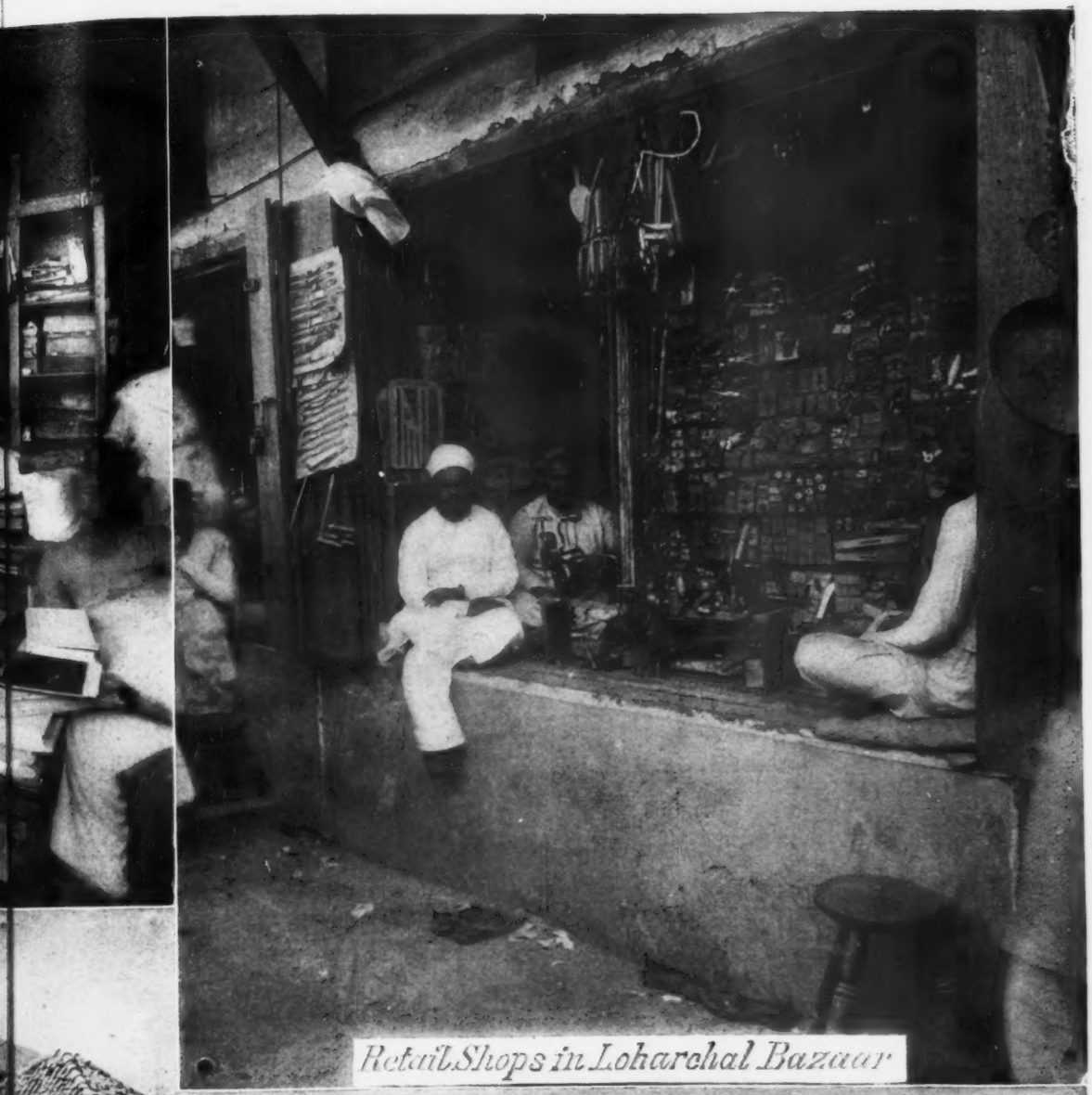
Wholesale Shop of E. E. Kurwa & Sons.



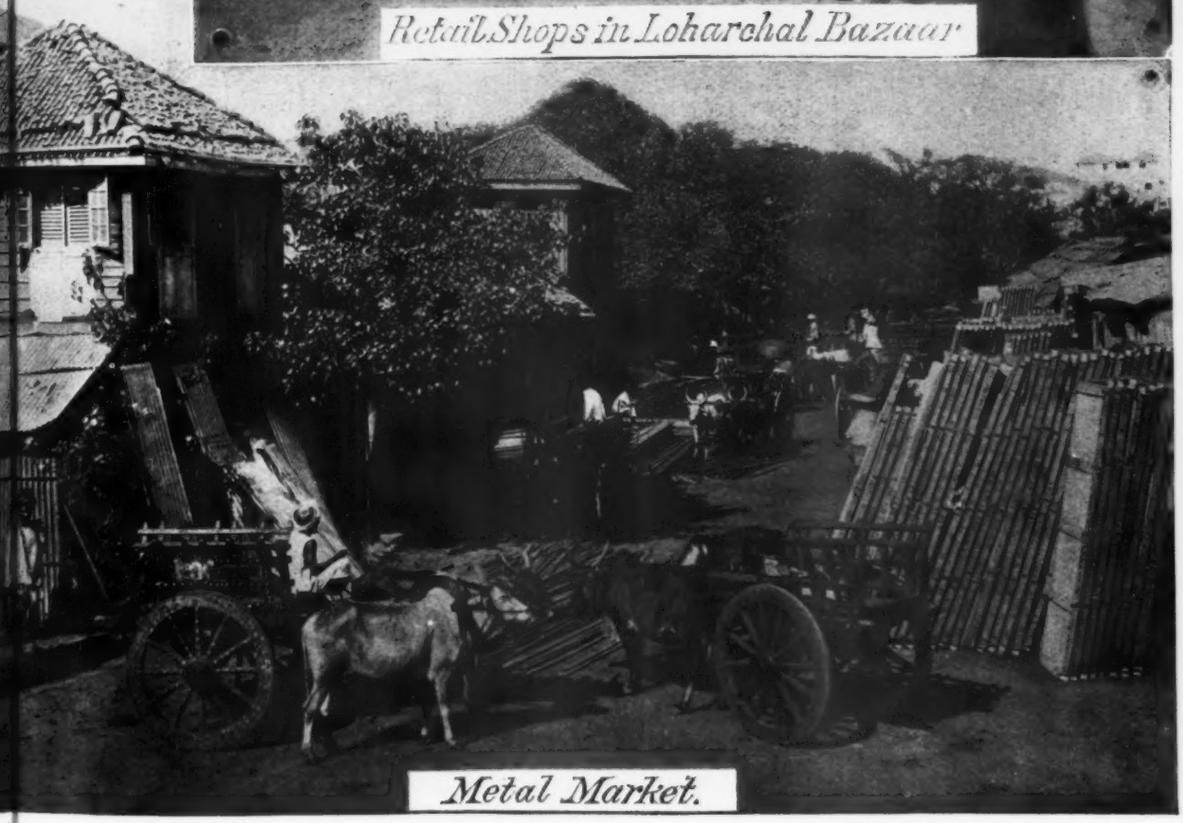
Wholesale Shop of Eabhoy Tyebally.

HARDWARE AND METAL

From Views Obtained by Polhemus Lyon, Special Foreign Representative of THE IRON AGE.



Retail Shops in Loharchal Bazaar



Metal Market.

L HOUSES, BOMBAY, INDIA.

Hardware in India.

THE LAST LETTER which we have from Polhemus Lyon, our special foreign representative, was written at Calcutta and bears date February 16. Shortly after that date Mr. Lyon and his party left India for Australia, where they are at present and will be for some time. The last advices received were by cable, which reported Mr. Lyon convalescent from an attack of typhoid fever.

The letter given below will be read with interest, describing, as it does in Mr. Lyon's usual direct and graphic manner, the business conditions to which it relates. The extent of the business done by some of the large houses in Calcutta will perhaps surprise some of our readers. In connection with this letter the illustrations given on a separate sheet will be of exceptional interest, showing as they do the manner in which the Hardware and metal trades are conducted by Hindoo merchants. Mr. Lyon's letter from Calcutta, February 16, 1892, is as follows:

This city, though numbering less than 700,000 people, against Bombay's over 800,000, far exceeds the latter city in imports of European merchandise. The largest English Hardware house in the East is located at Calcutta, where they have been 50 years or more; this concern inventory about $500,000 and are credited with having about everything that can be asked for. Another house with a liberal assortment of Ironmongery makes a good second, while a third branched out from the "original Hardware house of India," and are proving successful in finding a rank well earned by their enterprise and energy.

There are three English Gun houses at Calcutta, having large showrooms and ample stock; in fact, the leading Arms and Ammunition merchant outvies in elaborate fitting up any Fire Arms concern that I can recall at home. A servant in livery opens the great glass doors as you approach, you climb three or four marble steps to the principal room, with its marble floor and high marble wainscot, all deliciously cool; the cases on the side are filled with silver trophies which have been or may be prizes for sportsmen's contests, and these, with a very tastefully arranged display of sportsmen's goods, present a *tout ensemble* which must have aided the success of the house, or they supply several native governments with their munitions of war, often getting single orders for several "lakhs of rupees." A lakh is about $33,000. Such Hardware and Fire Arms concerns were a surprise after Bombay; their existance is due to the fact that a very large proportion of the English residents in India and Burmah are tributary, so far as their purchases go, to Calcutta.

The indigo and tea plantations are presided over by Europeans and their demand for supplies is increased through having such inferior servants. Here as everywhere else in the world are found Gould's Pumps, Fairbank's Scales, Yale Locks, American Lamps and Clocks, all of which seem to have penetrated the furthest recess of heathendom as well as Christendom. But, unfortunately, a great many lines which we export to other countries we cannot ship here because there is no direct communication for freight; shipping via London or Glascow entails double freight, which rules us out on many lines where our goods, at same price as the European manufacturers, gain us the business. It is true there are eight or ten kerosene vessels coming to this port from New York every year, but they do not offer advantageous facilities for general merchandise.

A report of Calcutta is not complete without referring to the native Hardware houses, who, together, do the larger business of the city; the chief of these have London connections who buy for them and pay their bills. This city has one native Hardware merchant, worth perhaps $1,000,000, and several others who do a large business, but none of these, so far as I could learn, had handled American lines. Naturally, they buy the commonest goods, using large quantities of "Kodallies," the great native tool made in Birmingham, and resembling our planter's Hoe.

A myriad of coolies, each with a basket and "Kodallie" are "the plant" with which great public works are accomplished; the Kilbourne & Jacobs Scraper cannot compete with these.

Referring to the ubiquitous coolie—when I had secured my sample room at Calcutta I drove down to the native furniture bazaar and hired 30 tables, 4 x 6, or such a matter, upon which to display my goods; returning to my office and growing impatient at their non-arrival I started out in pursuit, but was checked by a procession of 30 coolies marching in single file, each with a table on his head. It was not hard to divine that these were for me. These fellows came not less than a mile and were satisfied with 2 cents each for their services. Labor-saving devices are at a discount in India.

The illustrations given on the accompanying plate are reproductions of photographs taken in Bombay, India, by a Hindoo photographer of some note, Mr. Shivsanker, under the direction of our representative, Polhemus Lyon. A view of the "Lokhand Jutha," or native metal market, is given in one of the engravings, and shows the sheet metal stacked up in the yard and the ox carts ready to deliver the purchases.

The interior of the wholesale shop of E. E. Kurwa & Sons is represented in another illustration. This concern are ship chandlers and general Hardware dealers, on Shaik Abdool Rehmen street. This, we are advised by Mr. Lyon, is one of the very few shops where merchants are seen sitting on chairs, as they usually assume a cross-legged position upon cushions laid on the floor. This house is one of the largest establishments in that part of the country, and they are quite wealthy and speak English fluently. It will be observed that on the left, as one faces the picture, is a large assortment of Brass Fittings behind glass. Though the shop is perhaps only 30 feet front by 90 feet deep, it is the headquarters of a very large business. Our correspondent writes that one can form little conception of the extent of the business of a native merchant by the appearance of his shop. In this case we are advised that Messrs. Kurwa & Sons have, in addition to their store, six "go downs," or warehouses.

The wholesale shop of Eabhoy Tyebally is also represented, and this is much more indicative of the usual appearance of the Bombay shop, as here the merchant sits on a cushion behind a box which answers the purpose of a desk. While this merchant does not appear to have adopted many modern ideas in store arrangement, the goods on the sample boards have a familiar look. Mr. Tyebally deals almost entirely in German Hardware and has the reputation of buying the cheapest class of goods that he can obtain. Shops of this kind are, as a rule, small, not being over 15 feet front and, perhaps, 30 feet deep.

Three typical retail shops in Loharchal Bazaar are also represented, where the customer, as will be noticed, is provided with a stool in the street, upon which he sits while transacting his business. These shops have a frontage of perhaps 10 feet, while their depth is hardly as great as that. Mr. Lyon suggests that the proprietors could, not inappropriately, put out the sign sometimes seen over American restaurants of "Always Open," as these shops are open seven days in the week, and often from 6 a.m. to 11 p.m. The merchants whose shops are here illustrated are all Mohommedans of the Borah caste.

Trade in Louisville.

FROM a special correspondent we have the following advices in regard to the demand for Hardware, Nails, &c.:

Cut Nails are very quiet. Bar Iron seems low enough. If the mills are satisfied with present prices, the dealers and consumers certainly should be. General Hardware is going out in fair quantities, both in heavy goods and building material. As the season opens building prospects brighten, and the Lumber interests feel the improvement very quickly. Good Building Lumber has advanced $2 per 1000 over 30 days ago, and there is considerable movement in materials for short tramways, light rails, &c., in the Southern timber regions. Probably there has never been as much Wire Fencing put up in a season as is now being erected all over the country.

Collections continue good.

A PUBLIC SALE of Government Oil Stone land in Arkansas is announced on April 12. We are advised that maps and other information in regard to the sale can be obtained from George Chase, 107th street and Harlem River, New York.

New York Hardware Club.

A MEETING of those in the trade who are interested in the formation of a Hardware Club was held at the office of *The Iron Age* last Saturday. Some matters in connection with the project were discussed and the meeting adjourned to the Cosmopolitan Hotel, Saturday, April 9, 3 p.m., for the consideration of the constitution, by-laws and rules.

Whips.

IN THEIR ADVERTISEMENT occupying a page in this issue the American Whip Company, Westfield, Mass., refer to their capacity as 2,500,000 Whips per annum, and state that they manufacture standard Whalebone, Raw Hide and Java Whips in every style and at the lowest prices consistent with the best quality of workmanship and material. Views are also given of their factory at Westfield and their warehouses at New York, Chicago and San Francisco. The company, at Westfield, Mass , claim a capacity of over 2,500,000 Whips per annum and the distinction of being the largest Whip manufacturing concern in this country. They make, we are advised, upward of 1000 styles, and 15,000 dozen Whips have been made by them in one month. A barrel of glue a day and 250 tons of rope a year is used for winding, and 5000 pounds of rattan a day are sawed up for use in this establishment. Whips are apparently simple things and Hardwaremen sell them without a thought of the ingenuity required to manufacture them. From the whale to the finished whip is a long jump and is accomplished only with the aid of a large number of hands and many specially designed machines.

Kelly Axe Mfg. Company.

IN THIS ISSUE among the advertising pages will be found a reproduction of a photograph recently taken of the plant of the Kelly Axe Mfg. Company, Louisville, Ky. In connection with the description of the plant in our issue March 17, when ground plans of the entire works were given, this representation of the establishment will be of interest as showing the modern developments of the West in large manufacturing establishments. The business of the Kelly Axe Mfg. Company was started 18 years ago on a very limited scale, but it has so grown as to justify the present plant with a capacity of 4000 Axes per day and a well established trade.

In the recent enlargement of the works the buildings and machinery were so arranged that hereafter additional buildings and machinery can be added without requiring any changes or alterations of the present plan or stoppage of the works. The power is centrally located and is, we are advised, ample for driving double the present machinery. The company have their own machine shops and patterns and are prepared in four to six weeks to increase their output to 5000 or 6000 Axes per day, or more if required. The company refer to Louisville as being in such proximity to the South, the great timber region of the country, where large quantities of Axes must be consumed, as giving them an advantage in the matter of freights, which are so important an element in these days of close competition.

The modified form of co-operation adopted several years ago by the company, when all the foremen were interested as stockholders in the company, has, we learn, proven so successful in its results that the company are considering the advisability of extending the system to all their deserving employees, and there is little doubt that this will be carried into effect. The company advise us that their policy has always been "fair treatment to their men," and during the past 18 years the business has never had to suffer from an organized strike. From the beginning to its present growth the company attribute a great part of their success to the good will existing between themselves and their employees. Surpless, Dunn & Alder, 97 Chamber street, New York, are agents for the company.

Trade Items.

BRYDEN HORSE SHOE COMPANY, Catasauqua, Pa., issue an exceptionally effective and handsome cloth metal-end hanger. It is 22 x 27 inches, showing a gigantic Horseshoe nearly the size of the hanger representing their Boss Shoe. The space inside the Shoe is filled with a picture of a lady on horseback and a booted and spurred horseman standing by her side, done in imitation of water colors. At the bottom of the picture is their trade-mark, a three-leaved clover, and the words "Horse and Mule Shoes." The hanger is an attractive one, and the company are to be congratulated upon their artistic production.

CHICAGO SHOT TOWER WORKS, Chicago, referring to the fact that the ordinary method of handling Shot in a retail way is open to many objections announce that to overcome these objections, they are offering their Tower Brand Shot. This Shot is put up in 1-pound packages and packed 25 in a neat, strong box, which it is claimed can be shipped by freight at fourth-class rates. It is stated that the packages are patented and specially made to hold the required weight and to stand rough handling. The company refer as follows to the advantages connected with packing Shot in this manner:

> There is no loss by spilling, as when weighing from a case or bag. There is no loss by giving down weight, as is done when selling in the ordinary way, and thereby getting only about 20 pounds out of a 25-pound bag. There is no danger of sizes getting mixed, as they do in a case. The Shot is ready to give to a customer without spending any time in wrapping it up and tying it so the Shot will not spill out.

IN THEIR ADVERTISEMENT, occupying a page in this issue, Lane Bros., Poughkeepsie, N. Y., for whom John H. Graham & Co., 113 Chambers street, New York, are agents, illustrate their Lane's Patent Steel Barn-Door Hangers. These Hangers are shown in both the standard and covered patterns, with reference to the advantages which they possess.

THE STANLEY RULE AND LEVEL COMPANY deny that the chief use of their Roofing Bracket is to place on the roofs of summer hotels to support water pails, or to serve as fire escapes for the guests. Some of the Brackets have been so used; but their principal use is with the country carpenter, in shingling or patching roofs. That carpenters appreciate the merits of the Brackets may be best known from the fact that the manufacturers report the sale of 45,000 up to the opening of the present season.

THE NUBIAN IRON ENAMEL COMPANY of Cragin, Ill., have favored us with their desk calender for the coming quarter of the year. The calendar is in very convenient form, and will be appreciated by those who have occasion to make memoranda of engagements, &c., from day to day. Each daily slip bears something pungent from the pen of the ready-witted Bonnell. Copies of this calendar are sent to any address on application to the company.

GEO. B. MILLER, Western manager of Wallace & Sons, Brass and Copper manufacturers, occupies a fine suite of rooms in the Western Bank Note Building, Chicago. One of the rooms is occupied for the display of samples of Lamps, to which the firm are now giving special attention. The line shown is extremely handsome, covering a very great variety of Lamps from the most ornate Piano Lamp to the small Reading Lamp. Beautiful onyx tables are shown forming a base for Piano Lamps. The brass work turned out by this firm is of the most artistic design and superb finish.

T. C. HOAGLAND of New York is the sole agent for the sale of the Wakefield Pipe Wrench, manufactured by J. E. Wakefield, Worcester, Mass. Mr. Hoagland states that in a recent trip through New York State and New England in the interest of his several commission accounts he established a very satisfactory demand for this Wrench.

IN A FIRE on March 19 in the dry goods store adjoining Stewart, Smith & Bergen's Hardware establishment, Fort Plain, N. Y., the stock carried by the latter was damaged by smoke. We are advised that an insurance of $250 has been allowed on the loss thus sustained.

G. G. BRINTON, representing the St. Joseph Pump Company, St. Joseph, Mo., paid the trade in St. Louis a flying visit last week. He informs us that the Perfection Water Elevator and Purifying Pump, which the company whom he represents manufacture, is finding additional favor with the trade, and that their sales for the first quarter of the present year show a gratifying increase over the same period of last year.

THE HARDWARE STORE of G. A. Clark, Earlville, N. Y., was burned out on March 31 The loss on building is estimated at $10,000, and on stock, $8000. Mr. Clark advises us that he would be glad to receive price-lists from manufacturers.

THE TRADE WILL LEARN with much regret of the death of Mrs. Henry S. Blossom at Cleveland, Ohio, last Sunday. Mr. Blossom's many friends will deeply sympathize with him in this bereavement.

THE TRADE WILL OBSERVE the advertisement of Surpless, Dunn & Alder, 97 Chambers street, New York, in which it is intimated that a list of the goods which they are selling will be given in our next issue. This house is representing a number of leading manufacturers, among whom are the following: Kelly Axe Mfg. Company, Lindsay & McCutcheon, Hussey, Binns & Co., H. Chapin's Son, W. A. Ives & Co., Keystone Lock Works, Western Block Company, Cronk Hanger Company, C. Hammond & Son, John Auer, Jr., Lamson & Sessions Company, Marietta Mfg. Company, Nashville Spoke and Handle Company and others.

THE YALE & TOWNE MFG. COMPANY of Stamford. Conn., have recently added a new department to their older lines of product. The new department, which will

produce a full line of Cabinet and Trunk Locks, is in process of rapid organization under the direction of F. W. Mix, whose long identification with this business at Terryville, Bridgeport and New Britain has given him large experience in this special line of work. The new department occupies a building especially erected for it, which is fully equipped with new and modern machinery of the highest class, and which is at present wholly devoted to tool making and preparations for a large manufacture. This work has been pushed vigorously during the past winter, and the tools are already completed for a large number of locks of leading styles. Productive operations will be begun in a short time, as soon as the tools are completed for a sufficient number of Locks to justify the company entering the market. Plans are already prepared for extensions to the building, which will be provided as rapidly as the work of production can be organized, it being the intention of the company to ultimately enter the market with a line of Cabinet and Trunk Locks comparable in extent and at least equal in quality to any heretofore made.

IN THEIR ADVERTISEMENT in this issue, W. & S. Butcher, Sheffield, England, and 135 Duane street, New York, mentioning the fact that for more than 100 years they have been makers of the celebrated Wade & Butcher Razors, direct particular attention to their Special brand, and give in *facsimile* their different corporate trade-marks with which their genuine Razors are marked.

RUDGE & MORRIS COMPANY, dealers in Hardware, &c., are at Lincoln, Neb., and not Omaha, as stated in a recent issue.

JOHN G. ROLLINS has severed his connection with John G. Rollins & Co., Limited, of London, England, and has opened an office at 4 Stone street, New York City, where he will continue his foreign agency business. Mr. Rollins has been in the export trade for many years, and is well known to a large number of American manufacturers and foreign buyers.

THE ADVERTISEMENT of F. I. Peckham & Co., 365 Market street, Newark, N. J., illustrates the Economy Nail Puller, which they are putting on the market This Nail Puller is described as made of one piece of the best quality of tool steel.

Price-Lists, Circulars, &c.

CINCINNATI SCREW AND TAP COMPANY, Cincinnati, Ohio: Catalogue showing Cap Screws, Collar Screws, Coupling Bolts, Machine Screws, Blank Nuts, Hexagon Nuts, Planer Head Bolts, Taper Pin Reamers, Iron and Steel Set Screws, Iron Milled Studs and Steel Taper Pins. On the last page of cover they illustrate the two forms of screw threads in use in the United States. Separate circulars are also issued relating to their Victor Coal Hod and Improved Vise.

THE OSSAWAN MILLS COMPANY, Norwich, Conn.: Catalogue of Twisted, Braided and Woven Goods in Silk, Worsted, Cotton and Wire. The company allude to this as their first complete illustrated catalogue of their Cords, Wires and other goods. They state that with their patented machinery they are able to manufacture a great variety of Twisted, Braided and Woven Goods, which they cannot illustrate as they are for special orders. They expect that the system they have adopted in numbering and classifying goods will lessen the possibility of mistakes, and suggest that their terms and numbers be used on all orders. The catalogue is well printed and represents Braided and Twisted Wire Picture Cord, Braided and Twisted Picture Wire, Picture Hangers with nail and hook, Patent Wire Coil Holder, Adjustable Picture Wire Reel, Worsted Picture Cord, Cotton and Worsted Shade Cord, Braided and Woven Shade Line, Braided Traverse Cord, Fancy Braided Cord, Ventilator or Shade Cord, Solid and Soft Braided Chalk Lines, Solid Braided Garden, Mason, Awning and Clothes Lines, Solid Braided Sash Cord, Cotton Lines, &c. A discount sheet accompanies the catalogue.

HULBERT BROS. & CO., 26 West Twenty-third street, New York: Catalogue No. 26, February, 1892. The interesting line of Arms, Ammunition and Athletic Goods manufactured by this firm are illustrated and described. The catalogue shows a large assortment of Revolvers, pages 3 to 38 being occupied with their presentation. Rifles are then illustrated, followed by Ammunition of the American Cartridge Company and Revolver Cases. Athletic Goods are then taken up and illustrations are given of their Bicyclists' Trouser Guard, Fencing Foils and Accessories, Chest Weights, Rowing Machines, Indian Clubs, Dumb Bells, Boxing Gloves, Tennis Goods, Football Goods, Baseball Goods, the Majestic Safety Bicycle, Boats, &c. The catalogue is accompanied by an appendix in which the net trade prices on the goods shown in catalogue are given. A separate catalogue of Boats and Bicycles will be furnished on application.

INTERCHANGEABLE TOOL COMPANY, Boonton, N. J.: Catalogue of Hall's Patent Compound Lever Nippers, Adjustable Face Vises, Telegraph Pliers, Improved American Pliers, Center Cutting Pliers, Side Cutting Pliers, Champagne Wire Cutters, Telephone Pliers, End Cutting Nippers and Compound Lever Seal Press, which are referred to as interchangeable in all their parts. The company state that they have largely increased their facilities and call special attention to their new Side Cutting Pliers for telephone and telegraphic use.

E. T. BARNUM, Detroit, Mich.: Spring catalogue for 1892. This catalogue consists of 116 pages, and represents a large variety of the most modern designs in Art Wire and Iron Work, as well as the most popular and seasonable goods. Flower-Pot Stands, Spark Guards, Settees, Cemetery Fences and Gravo Guards, Netting, Coal and Sand Screens, Window Guards and Grills, Bank, Office and Counter Railing, Brass Wickets, Metal Panels for counters, elevators, &c., Hay Racks, Stable Fixtures, Weather Vanes, Circular Iron Stairs, Ornamental Iron Stairways, Iron Cresting or Roof Railing, &c., are thus illustrated. It is stated that the excellence and quality of these goods will be fully maintained, and that with increased facilities orders will be filled promptly.

HIBBARD, SPENCER, BARTLETT & CO., Chicago: Fishing Tackle. This catalogue, No. 114, is devoted to Fishing Tackle and Fishermen's Goods. Illustrations and prices are given of a large line of these goods, and prices will be quoted upon any goods desired.

NASON MFG. COMPANY, New York, issue a discount sheet to apply to their catalogue as revised October, 1891. Their line of goods embrace Fittings, Brass Goods, Boiler Tubes, Steam and Hot-Water Heaters, Plumbers' Supplies, &c.

E. C. STEARNS & CO., Syracuse, N. Y.: Hardware specialties. Their 1892 catalogue is bound in flexible cloth covers, containing 80 pages of illustrations, prices and descriptive matter. Special attention is called to their Improved Warner Single Track Hanger, Gem Hanger, No. 51 Spring Hinge, Unbreakable Steel Spring Hinge, Double-Acting Spring Hinge, Stearns' Floor Hinge, No. 75, and the Stearns' High-Wheel Lawn Mower; all of which are referred to as new goods. The manufacturers state that in addition to the increase which they have made in their manufacturing facilities during the past two years, they are now engaged in completing a commodious brick building 153 x 60 feet four stories high, constructed on what is termed the "slow-burning" plan. The catalogue is an attractive one, being fine typographically as well as in the quality of paper used.

THE BARNES MFG. COMPANY, Phœnix, N. Y.: Phœnix Vises, Sash and Safety Chains and Hardware Specialties. Their catalogue gives illustrations and list prices of a large variety of patterns of Phœnix Vises, Pipe Vises, Plumbers' Safety Chains, Door Checks, Door Springs, Barrel Trucks, Christmas-Tree Holders, Window Cleaners, Locking Chains, &c. A discount sheet accompanies the catalogue.

R. ARMIGER & SON, Baltimore, Md.: Illustrated catalogue and price-list, 1892. This catalogue contains 32 pages and is finely printed. The well-known line of Refrigerators manufactured by the above firm are effectively illustrated and described, special attention being called to their Sterling, Climax and Alpine patterns.

L. H. MACE & CO., 111 to 117 East Houston street, New York: Wholesale catalogue, 1892. This catalogue represents the extensive line of Refrigerators, Children's Carriages and Woodenware of which they are the manufacturers. They state that their 64-page Toy catalogue, showing a complete line of foreign and domestic Toys, will be forwarded on application.

BACKUS WATER MOTOR COMPANY, Newark, N. J.: Catalogue 1892. This catalogue represents their patent Rotating and Exhaust Ventilating Fans, the Backus Water Motor, Ventilating Wheels, Patent Exhauster and Wool Dryer, Exhaust Ventilating Wheel and High Speed Engine Combined, &c. Their Patent Rotating Ceiling and Column Fans are manufactured in 11 styles and 10 sizes. The company state that their nickel plated clutch has been improved and still contains all the useful features which enable the blades to be thrown at any angle or stopped and started at will. The company also issue a catalogue relating especially to the Backus Water Motor which is designed to furnish power for driving all kinds of light machinery, built with or without a governor. A small pamphlet illustrates the hardship of dining in fly-time when there is no Ventilating Fan in the immediate vicinity.

SYRACUSE CHILLED PLOW COMPANY, Syracuse, N. Y.: Catalogue representing patented Steel, Iron and Wood Beam, Chilled and Steel Plows for level land and hillside, Wheelbarrow Grass Seeders, Spring Tooth Harrows, Cultivators, Road Scrapers, Horse Hay Forks and Carriers, &c. The company refer to having increased the capacity of their plant during the past year, particularly in their foundry and forge shop. Since issuing their last catalogue they have added several new features, notably that of a series of Gang Plows. These Plows are made in six different sizes and in three different styles, so that they are adapted it is claimed to all kinds of work from breaking new land to cultivating vineyards, hopyards, &c. To their Hillside line of Plows the company state they have added a line of all-steel, particularly adapted to light soils, garden work &c

HULBERT BROS & CO., successors to Merwin, Hulbert & Co., 26 West Twenty-third street, New York: Bicycles. This, their fifth annual catalogue, gives illustrations and prices of the line of Bicycles and Bicycle Sundries carried by them, with the exclusive territory controlled by them on the various machines. On the Majestic a wheel of their own manufacture, they state that the world is their field. It has not been their aim only to cater to the majority, who want medium weight machines, but to offer for sale one or two of the lightest possible weight machines for those who want something feather weight. In selecting sundries they have not accepted everything that was offered, but have endeavored to secure what their trade demands and to be in every particular "up to date."

JOHN DUER & SONS, 28 South Charles street, Baltimore, Md.: Fox and other Furniture Casters, including Martin's, Yale and Gem. Cabinet Hardware and

Upholstery Goods are also put on the market by them as manufacturers, importers and jobbers.

JOSEPH W. WAYNE, 124 Main street, Cincinnati, Ohio: Price-list, 1892. The Wayne Cork Filled Self-Ventilating American Refrigerators are illustrated and described, together with Grocers' Sliding Cover Ice Chest, Oyster or Steamboat Chests, Beer and Ale Coolers, &c. An illustrated price-list relating especially to Coolers is also issued.

DRAPER & MAYNARD, Ashland, N. H.: Base Ball Mitts and Gloves. These goods are represented in a small pamphlet, in which illustrations are given of their Irwin's Professional Catcher's Mitt, First Baseman's Mitt, Amateur Catcher's Mitt, Youth's Catcher's Mitt, Infielder's Glove, Leather Tipped Glove, &c. Fencing Gloves and Plastrons are also shown, The manufacturers state that they will be glad to send for examination their sample line of Mitts and Gloves.

THE PAIRPOINT MFG. COMPANY, New Bedford, Mass.: Illustrated catalogue and price-list for 1892, representing the company's productions in heavily electro silver plated hard white metal and nickel silver. The catalogue comprises over 200 large pages copiously illustrated with excellent cuts on paper of good quality. A duplicate index is given, one at either end of the catalogue, thus facilitating reference. A view of the factory of the company is also presented. It is stated that the buildings of the plant are 700 feet long, 40 feet wide, and the larger portion four stories high, thus representing a floor space 40 feet in width and half a mile in length. The company's salesrooms are as follows: 20 Maiden lane, New York; 90 and 92 Wabash avenue, Chicago; 220 Sutter street, San Francisco, and Sydney, Australia.

AMERICAN SAW COMPANY, Trenton, N.J.: Price-list, 1892. This is a publication of 32 pages and represents the line of Circular, Mill, Mulay, Gang and Crosscut Saws, Sawmakers' Tools, Mandrels, Swages, Wrenches and Emery Grinding and Buffing Machines manufactured by the company. Information is also given in regard to replacing, filing and swaging teeth, hanging circular saws, gumming saws, speed of circular saws, &c. The company's branch office is at 35 Dey street, New York, with agencies as follows: William Ward, Bay City, Mich.; J. E. Fox, Seattle, Wash.; S. C Forsaith Machine Company, Manchester, N. H., and W T. Adams Machine Company, Corinth, Miss.

ELASTIC TIP COMPANY, Boston and Chicago: Bicycle Tires, Bicycle Handles, Spade Grips, Tire Cement, Pedal Rubbers, Soft Rubber Handles, Bicycle Spokes, Bicycle Balls, Bicycle Horns, Oils, &c. Bicycle Specialties, also Rubber Mold Work. The manufacturers state that it is their desire to make a class of goods that shall stand first in the market, either here or abroad, for quality and durability.

PULLMAN SASH BALANCE COMPANY, Rochester, N. Y.: Improved Pullman Sash Balance. Illustrations are given of Side Balances, Top Balances, Car-Window Balances, Show-Case Balances, Wall-Case Balances, Pullman Door Springs and Giant Sash Lock. The manufacturers state that their new improved Balance is the result of years of careful study, and that it is a most marvelous article in itself for counterbalancing the exact weight of the sash

It is Reported—

That Bostwick & Pitts will open a first-class Hardware store in Phelps, N. Y.

That Phillips & Davis have recently entered the Hardware business at Girard, Ohio.

That the firm of Nichols & Converse, Hardware dealers, Wellsboro, Pa., has been dissolved. Mr. Converse has purchased the interest of his partner and will continue the business.

That John Rambo, who has been in the Hardware business at South Byron, N.Y., about 35 years, has sold out to Anthony J. Waterman of Morganville. The latter took possession April 1. The age and ill-health of Mr. Rambo compelled him to make the change. He will leave about July 1 for Brown's Valley, Minn., where he expects to reside.

That E. C. Howard has recently purchased the Hardware store of F. B. Gleason & Co., Whitman, Mass. Mr. Howard had been for 14 years connected with the Hardware business in Vermont.

That Maurer & Pabst, Hardware merchants, Eureka, Cal., have taken possession of their new store.

That the Garfield Hardware and Implement Company have been incorporated at Garfield, Wash. The capital stock is $26,000.

That the Remington-Johnson Company have filed articles of incorporation at Salt Lake City, Utah. The concern will do a wholesale and retail business in Hardware and general merchandise in Utah and Nevada. The incorporators are Mr. Foley, William H. Remington, Hiram Johnson, George Bennett and T. W. Lawrence. The capital stock is $180,000.

That the name of the Bliss-Cotton Hardware Company, Denver, Col., has been changed to the Ralph-Cotton Hardware Company.

That H. M. Graybill will soon open a Hardware store at Hesston, S. D.

That the Hardware store of L. S. Ellsworth, Hot Springs, S. D., was destroyed by fire several weeks ago. Loss, $5000; insurance, $3000.

That H. R. Rice of Minden City, Mich., will open a large Hardware store at Brown City. He will put in $5000 worth of stock.

That W. C. Watson and W. B. Shales will engage in the Hardware business in Burlington Township, Ill.

That John Henne, dealer in Hardware, Youngstown, Ohio, has recently removed his stock to a new location in that city.

That Edward Seeley has sold his Hardware business at Lyons, Ohio, and will locate at Delta.

That Charles Decker of Middletown, N. Y., has purchased the Hardware store of John Watts of Monticello, and has taken possession.

That Charles C. Bennett has recently entered the Implement business at South Wayne, Wis.

That the Genesee Hardware Company, Genesee, Idaho, are tearing down their old building and will erect a block on Main street, 50 x 80 feet, two stories high.

That E. M. Sloan, of the Hardware firm of Sloan & Auger, Hartwick, N. Y., has sold out to his partner.

That Andrew Patterson of Martin, Mich., has sold his stock of Hardware to Murry & Campbell, who will continue the business.

That a new Hardware firm is to be opened in Minden City, Mich., under the firm name of Thayer & Jones.

That O. P. Wilcox has commenced the retailing of Implements at Columbus Junction, Iowa.

That A. B. Cummings & Co. have recently begun the Implement business at Hampton, Iowa.

That Matthiessen Bros., dealers in Hardware, Monticello, Iowa, have disposed of their business.

That the R. B. Webb Hardware Company are a new Hardware firm at Crystal Falls, Mich.

That J. Schrietter has commenced the Hardware business at Fort Recovery, Ohio

That Stover & Sites, Ashland, Ohio, have disposed of their business.

That Creston, Ohio, has a new Implement firm under the style of Rockey & Keeney.

That W. D. Lemmond, groceries and Hardware, Lancaster, S. C., has sold out his business

That the Hardware stores of F. W. Berry and H. V. Hudson, Luray, Va., were burglarized on the 24th ult.

That W. B. Johnston, Hardware dealer, Spring Grove, Pa., is to erect a building, which he will occupy when completed.

That the Hardware firm of Nichols & Converse, Wellsboro, Pa., has been dissolved Chester R. Converse will continue the business.

That W. L. Judson, Torrington, Conn., will remove his Hardware stock to new quarters.

That Whitman & Teague, East St. Louis, Ill., dealers in Hardware and Agricultural Implements, have gone out of business.

That J. H. White has opened a new Hardware store at Shelbyville, Ill.

That Dolan & Leib, Implement dealers, Winchester, Ill., have dissolved. D. C. Leib will continue.

That J. W. Alexander, Corning, Iowa., dealer in Stoves and Hardware, has retired from business.

That Crabtree & Jenkins have commenced the Implement business at Dows, Iowa.

That M. Anderson is a new Implement dealer at Linn Grove, Iowa.

That Savre & Tolleprud, Northwood, Iowa, have sold out their Implement business.

That W. A. L. Donaldson is a new Hardwareman at Preston, Minn.

That Resor & Schreyer have lately entered the Hardware and Stove business at Kahoka, Mo

That Wellsville, Mo., has a new Hardware and Implement merchant in the person of A. J. Brian.

That Clark & Teas have recently begun the Implement business at Indianola, Neb.

That Todd Bros., St. Stephen, Province of New Brunswick, Hardware merchants, recently suffered a loss by fire.

That W. E. Jakway and Lavella A. Phillips, Kearney, Neb., have formed a partnership to carry on the Hardware business.

That Fred. Shrader has purchased the Hardware store of O. M. Young, Berlin, Neb.

That F. E. Kruse has purchased a half interest in the Hardware store of W. Swarts, Douglass, Neb.

That H. Madeson is to open a Hardware store at Pine Island, Minn.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

Further improvement is noted in the distribution of various lines of Paints and Colors in this quarter, and a more liberal receipt of out-of-town orders is also referred to, indicating that favorable weather conditions latterly have served to bring about something in the nature of spring-season activity. Housepainters' goods figure most conspicuously in the improvement, but larger sales are noted in Metallic Paints and several other specialties, mak-

ing altogether a flattering contrast with the experience of a month ago. In base materials there have been no changes calculated to affect values of the manufactured goods and competition in sale of the temperate. Hence, not only a good, seasonable business, but steadiness to values all along the line is to be recorded.

White Lead.—Corroders note more numerous orders for round lots of their product and more liberal sales of ordinary quantities, which would indicate a freer distribution by jobbers and decided increase in the consumption. At second hands there is still more or less deviation from the quantity prices quoted in the National Lead Company's list, but the concessions are merely in line with those that have been common for some time past. The better class of Lead-Zinc mixtures have also met with fairly brisk sale and more or less increase is noted also in the movement of the cheaper varieties of Mixed-Leads, with prices throughout remaining practically the same as they have been quoted since the beginning of the year.

Red Lead and Litharge, &c.—For the finer class of product used by the Paint trade there has been a very steady demand, with the average rather larger than that of the preceding week and running quite as full as usual at this season. Low grades for glass makers' use are moving fairly at old prices. In Orange Mineral there has been a freer movement, but no change in values of either foreign or domestic.

Oxide Zinc.—Deliveries by American manufacturers continue on a large scale, and the new business passing is of quite liberal volume also. Between the two the movement is kept quite up to a full average for the season, absorbing a large portion of the product of Eastern manufacturers. The New Jersey Zinc Company, for example, is officially reported to have delivered 7504 tons during the month of March, while some other companies are understood to have done relatively as well. In foreign brands there has been a good steady trade in a quiet way that absorbs current importations at steady prices. Official returns show that the receipts at this and other ports during the first quarter were fully as large as those of the corresponding period last year.

Colors, &c.—For several lines of grinders' Colors the demand is now quite free and steadier, if anything, than it has been heretofore this season, indicating a liberal outturn of prepared goods by manufacturers. Dry Colors adapted for house painters' use have also met with somewhat more liberal sale, as have also several varieties of Oil Colors, with prices standing practically the same as they have been for some time past. No changes in prices have occurred, and, outside of a slight reduction in price of Quicksilver, base materials remain almost stationary in value. Metallic Paints are selling quite freely now at good prices, and gradual improvement is noted in the distribution of the general line of mixed Paints, more particularly the specialties used for yacht decoration, carriage painting, &c.

Miscellaneous.—Block Chalk is still quoted at $1.35 @ $1.45 ₱ ton, ex-steamer, or 40¢ @ 45¢ below the inside price named for sail-vessel cargoes, and moves rather slowly at the moment. Considerable quantities of English China Clay are selling for forward delivery, and there is a good business also in Terra Alba and Talc, while American brands come in for a full share of attention. Barytes of domestic product are meeting with quite free sale and there is a fair business also in foreign. Whiting is meeting with fairly brisk sale, chiefly at old prices.

Oils and Turpentine.

Few really new features are to be recorded for the week under review. If anything, the home distribution has been freer nearly all along the line than for some time past, and, while export movement figures with no prominence nor orders from foreign markets assume any considerable proportions, the current movement proves to be full enough in nearly all departments to keep values very steady for all domestic productions. In imported goods there have been no changes outside of Cocoanut Oil, which commodity, in common with nearly all East India merchandise, is more or less affected by the effect of the unsettled condition of the market for silver upon exchange.

Linseed Oil.—The higher prices established last week have been fully maintained and the market is strong at the advance. Western crushers, it is asserted, find so good an outlet near home that they are not only offering very sparingly in Eastern markets, but seem to work harmoniously in the direction of keeping values stiff in the face of a rather weaker market for seed. City crushers are enjoying a very good trade and secure some orders for supplies for delivery a short time ahead in addition to the freer sales for prompt delivery. Some uncertainty is caused by the irregularity of the market for raw material, but sellers generally express confidence in the future of the market. Another advance in prices was made all along the line during the latter portion of the week. Sellers of out of town brands marked their figures up to 39¢, and city crushers are now quoting 40¢ for domestic seed product and 58¢ for Calcutta.

Cotton Seed Oils.—In this line there appears to be a rather firmer undertone, the result of smaller production at some Southern points and recent sales of considerable quantities for export and to large home consumers. Prices are not positively higher, if exception be made to bids on large lots for deliveries within a certain period that could hardly be given, but figures that were extreme last month are common on current transactions. Business in crude has been chiefly at prices on the basis of 24½¢ @ 25¢ for prime. About 2000 barrels Winter White have been sold for delivery during the next sixty days, about one-half of which was for export, and nearly as much Summer Yellow at 28¢ for good and 28½¢ for prime quality.

Lard Oil.—In this line business has been somewhat uneven, yet of very good proportions all told, and prices have varied a little, although showing no wider fluctuation than 1¢ per gallon. Business has been chiefly at 56¢ @ 57¢ for city brands of prime, and 1¢ less for Western, with low grades selling at about the usual discount.

Fish Oils.—The 3500 barrels of crude Menhaden Oil recently secured from European markets, it is said, leave the foreign market without surplus to draw upon, and there is now practically no supply outside of pressers' hands. Crude Sperm and crude Whale Oils remain quiet; about 175 barrels Sperm sold at 69¢ here. In the manufactured goods there is a steady jobbing trade at old prices. Cod remains very firm.

Olive Oil.—The common grades used for mechanical purposes, soap making, &c., are all selling fairly at 58¢ @ 62¢ in barrels, according to delivery, and Salad Oil at $1.25 @ $1.75 in barrels and cans. The movement is of fair volume.

Cocoanut Oil.—Cochin has realized 5⅝¢ @ 5¾¢ on the spot, but round lots per vessel afloat have been offered at 5½¢, and future shipments at ⅛¢ @ ¼¢ less, without leading to much business.

Spirits Turpentine.—At prices slightly below the highest ones touched last week, there has been a good business and the market has preserved a steady tone. Stocks are slightly larger here, yet moderate all told, and the Southern statistical position continues strong.

CONTENTS.

English's Time Recorder.

Columbian Time Recorder Company, 32 Frankfort street, New York, for whom S. A. Haines, Indianapolis, Ind., is sole selling agent for all territory west of the Alleghenies, are introducing an automatic time recorder, as shown in Fig. 1. It consists of a polished oak case, 17 inches high, 14½ inches wide and 7 inches deep, in which the working parts are inclosed. On the top of the case is a slot in which

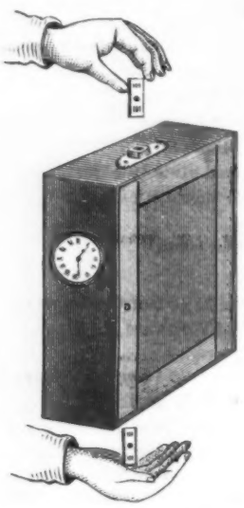


Fig. 1.—English's Time Recorder.

the checks are dropped, and on one side the face of the clock. Fig. 2 is a full-size reproduction of one of the brass checks used in connection with the recorder, each employee being known by the number on the check which he carries. The employee in passing the recorder drops his check into the slot at the top of the box and receives it in the other hand from the bottom. Checks can be recorded in this manner, one workman following another in succession, at the rate of 50 or more a minute, or they can be passed through the recorder by a single individual at the rate

Fig. 2.—Workmen's Recording Check.

of 125 a minute, the machine recording each check in a perfect manner.

The results of the recording are shown in Fig, 3, which is a reproduction of a portion of the printed record, as made by six workmen passing their checks through the machine. It will be seen that these men passed the recorder between five and eight minutes past 6 o'clock. It makes no difference which end of the check goes into the slot first, as the raised numbers for printing the record are near both ends of the check. The indented number 177, as seen at the bottom of Fig. 2, is simply to aid in identifying the number of the check readily, and to avoid errors which might occur in reading the raised numbers, which are necessarily arranged backward. The interior construction of the recorder consists of a train of gears, operating a hammer; a stop for the check, which also closes the slot; hour and minute wheels operated by a eight-day double-spring Seth Thomas movement; an inked ribbon and suitable reel for carrying the roll of recording paper. The check upon entering the slot is guided in its course downward by runways until it strikes an arm, which stops the check, holding it until it is recorded by a blow from the hammer, and at the same time closes the slot, so that but one check can be put into the slot at a time. The blow from the hammer releases the check, allowing it to drop out of the case, and also opens the slot for the reception of another check. The various operations which are gone through during the passage of the check from the time it enters until it leaves the case, while seeming complicated when given in detail, are in reality very simple, and only occupy a second of time or less. The manufacturers have made no effort to construct a cheap Recorder, but, on the other

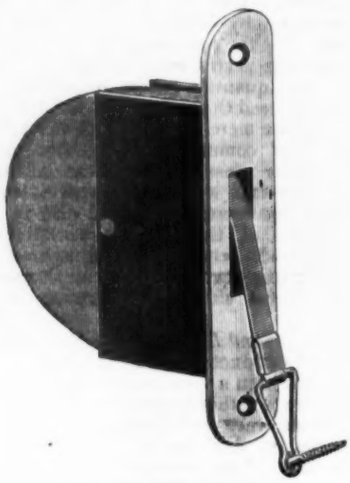
Time H. M.	Workmen's Nos.
6 $\frac{6}{5}$	22
6 $\frac{6}{5}$	32
6 $\frac{7}{6}$	14
6 $\frac{7}{6}$	40
6 $\frac{8}{7}$	12
6 $\frac{8}{7}$	19

Fig. 3.—Printed Record of Checks.

hand, have experimented until it has been brought to its simpliest possible form, and so perfected it that there is apparently no chance of it getting out of order nor breaking down. Each individual part is made of the best material and heavier that the requirements of the work would suggest as necessary, making the life of the machine almost unlimited. As a record of each employee's time is made by himself, it is only necessary to produce the slip to settle any dispute which may arise regarding the time work was begun or ended. The slip may be written up during the day, at the end of the week, or at any intermediate time, as desired. The case is locked and the key in the possession of the proper person, so that no meddling with the works is possible. The check system is one that meets the approval of employees, and the manner of recording the time with this machine so simple that the most ignorant day laborer readily falls in with the operation.

Pullman Side Balance.

Pullman Sash Balance Company, Rochester, N. Y., have improved the construction of their sash balance, as shown in the accompanying illustration. They state that in the manufacture of these goods only the finest grade of oil-tempered steel springs are used, which are fully warranted. The tape or suspending band is referred to as being of the best grade of aluminum bronze, and every balance is thoroughly tested before leaving the factory. The balance is arranged to exactly counterbalance the weight of the sash, and the point is made that it will outlast cotton cord, that it runs noiselessly, and that it has an attractive appearance. By the use of a steel frame it is shown that the balance is indestructible, and that the balance is entirely inclosed, so that no dirt can get inside. The face plate has oval ends, so that the mortise can be made for the balance with an auger bit. It is claimed that the



Pullman Side Balance.

brake being automatic is operated according to the tension of the spring in the drum when the tape is drawn out. Each set of balances contain a diagram, to place on the jamb, so the operator may bore the mortise correct and true, and they are also provided with Rogers' drive screws.

The New 1892 Bicycle Padlock.

E. T. Fraim, Lancaster, Pa., for whom Surpless, Dunn & Alder, 97 Chambers

The New 1892 Bicycle Padlock.

street, New York, are agents, is just placing on the market the padlock shown herewith, which is designed especially for bicycle use. The cut represents, full size, their Nos. 406C and 407C. These pad-

locks are described as made of solid bronze or gun metal, with dust-proof plunger, closing shackle opening, revolving-cylinder key guide and spring shackle, and are self-locking. The shackle is referred to as extra strong and securely locked by a double bolt. The chains are alluded to as made of nickel-plated steel, with a tensile strength of 510 pounds. They have steel-brazed rings and are 12 inches long. Two flat steel keys are furnished with each padlock.

Round Peanut Warmer.

Robert J. Masbach, New York, is introducing through the Albany Hardware and Iron Company, Albany, N. Y., a peanut warmer, as illustrated herewith. The bottom part is made of heavy sheet iron, varnished black, while the top is made of

Round Peanut Warmer.

heavy tin with a pit copper bottom and brass faucet. It can be used with an oil stove, and a separate furnace is furnished for using hard coal. They are made in two sizes, with a capacity of 13 and 18 quarts of peanuts each. The largest size is also made with the upper part all of copper.

Monarch Ball Holder and Dust Resister.

The accompanying illustrations show this article as used by the Monarch Cycle Company, Chicago, in all of the bearings of the Monarch Safeties, occupying a lateral position. This is referred to as being made of the finest sheet steel, and

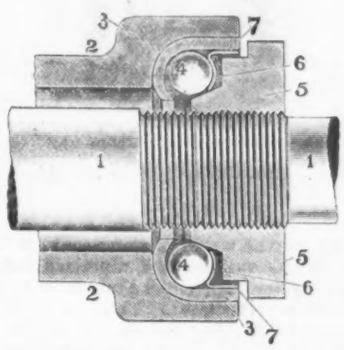


Fig. 1.—Monarch Ball Holder and Dust Resister.

as light and durable. In Fig. 1 the holder is represented in position by Figs. 6 and 7, No. 6 being the grooved part that covers the balls, and No. 7 the side turned up, and which springs against the side of the bearing case, No. 3, preventing it and the balls from falling out. It is stated that the groove allows the balls to revolve with perfect freedom. The point is made that the holder will be found of great convenience in cleaning a machine, as well as saving a great deal of time. The axle, No. 1, and the cover, No. 3, it

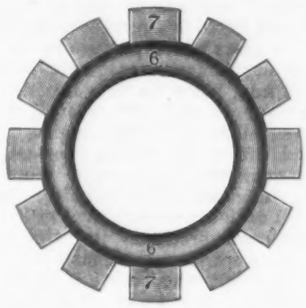


Fig. 2.—Holder Before the Side is Turned.

is shown, can be removed without disturbing the balls, as the holder keeps them in position, as well as protecting them from dust, and also retains the oil. The holder is removed by withdrawing it with the fingers, which may be done, it is stated,

Fig. 3.—Showing the Side Turned Up.

without marring the finish of the machine. Fig. 2 presents a view of the holder before the side, No. 7, is turned up; and Fig. 3 shows the side turned up, No. 6 being the groove. For placing the balls in a bearing case, the holder is referred to as a very useful device, as it is only necessary to insert the holder in the bearing cases and put in the balls.

The Worcester Fire Appliance Company, Worcester, Mass., are putting on the market a new Protection Chemical Fire Pail, which is described as made of metal, protected with the company's patent elastic non-rusting coating, and containing the same chemical as their well-known Worcester Chemical Glass Fire Pail. This pail has a capacity of 2 gallons of chemical, and is referred to as equal to 20 pails of water. It is claimed that the chemical will not freeze nor lose its strength and efficiency. The pail is painted red and lettered plainly, and is alluded to as adding to the appearance of a factory equipped with it. The manufacturers state that they are offering this pail at a low price, pointing out that it will be found just as efficacious as their higher-priced pail.

Word comes from Washington that advertisements for the construction of the proposed new war ships will be issued the moment the new Naval bill becomes a law. The preliminary plans for the sister ship of the New York, now being prepared, contemplate a vessel of about 9000 tons displacement, 400 feet in length, 65 feet in breadth, 24 feet draft, with sufficient horse-power to guarantee 21 knots an hour. Her battery is to be heavier than that of the New York, the plans calling for six 10-inch instead of 8 inch guns. Another important matter that will also receive prompt attention is the question of armor. In addition to the 12,000 tons of armor already contracted for about 5000 tons will be required to complete the amount necessary for the vessels already authorized. This latter amount, together with that which may be required for vessels to be authorized this session, will place at the Secretary's disposal the largest armor-plate contract ever awarded. The Secretary could contract for the 5000 tons required to complete the battle ships at the present time, but it is understood that he will wait until it is seen what additional amount will be needed for new vessels, when the two will be lumped in order that sufficient inducement may be offered other firms to increase their plants for the purpose of entering the competition. Up to the present time the Bethlehem and the Carnegie Phipps companies are the only two firms engaged in this work, but since it has been settled that the rolled plates made by the latter firm may be accepted as well as those made by the more expensive method of the Bethlehem company, other firms are disposed to establish plants and enter into competition. The Otis Steel Works of Ohio, it is understood, will be competitors for the forthcoming contract, so that three bidders at least may be depended upon.

Yale Pin Tumbler Padlock.

The Yale & Towne Mfg. Company, Stamford, Conn., and 84–86 Chambers street, New York, are offering the above padlock, as illustrated in Fig. 1. The

Fig. 1.—Yale Pin Tumbler Padlock.

operation of the padlock is the same as that of the other locks made on the Yale system, the security being obtained by a set of sliding-pin tumblers, as shown in Fig. 2, which can only be brought into position for unlocking by the insertion of the proper key. As will be seen by Fig. 1, the padlock is opened by inserting the key from the

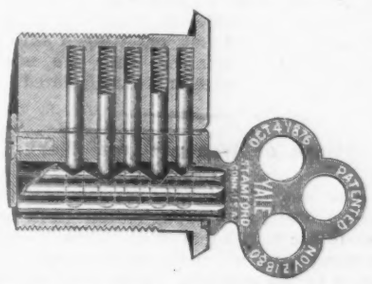


Fig. 2.—Yale Escutcheon and Corrugated Key.

bottom. This permits the plug, which is in one piece with the shackle, to be pushed in, lifting the dowel on the end of the shackle out of its recess, and also permitting the shackle to be turned into the open position. When the shackle is turned into the position for locking it springs into place, permitting the key to

be withdrawn, and is then securely held against force or picking.

The use of the Yale pin-tumbler system gives this padlock a vast number of key changes and a degree of security of the very highest class. The case is made of cast iron, with the rustless Bower-Barff finish, practically a solid block of metal, which is referred to as being very strong, and the shackle is made of tough bronze, giving a degree of strength far greater than any hasp or staple through which it is liable to be inserted. This padlock is made only in the 2-inch size, and is intended to meet the popular demand for a low-priced padlock which should at the same time possess a high degree of security.

Perfection Hose Pipe.

King & Goddard, 64 and 66 Pearl street, Boston, Mass., are offering the hose pipe as illustrated herewith. The pipe consists of two sections so arranged that a smooth solid stream or a fine spray, as shown in

Perfection Hose Pipe.

the cut, can be obtained by a quarter turn of the upper section; or the flow of water can be entirely checked by turning it half way round. The two sections are held together by a screw with a leather disk or packing between them. This screw can be turned with an ordinary screw driver, and is used for the correct adjustment of the parts. The manufacturers state that the packing can be renewed at any time by taking out the screw, and that no other repairs can ever be necessary. The Perfection is referred to as being neat in appearance, and as not requiring a skilled mechanic to repair it. They are made ¾ inch, in both brass and nickel plated.

Finish of Wrought-Iron Work.

The use of paint or varnish as a protective coating to wrought-iron work has heretofore been a matter of necessity, even in many cases where the work was not exposed to the weather. None the less, the use of any plastic material on the surface of wrought metal work tends to obscure or conceal its intrinsic qualities, and is therefore undesirable. In this respect the use of paint on handsome metal work is as objectionable as on handsome wood work. No one now thinks of covering a beautiful piece of wood with anything to conceal the true texture of the material. For the same reasons it is even more desirable, in the case of wrought metal work, to retain with all possible freshness the texture of the metal and the individuality given by the marks of the hammer.

Happily, science, in this as in so many other matters, has come to the relief of art. The method of treatment known as the Bower-Barff process, by which the iron work is subjected in a furnace to the action of certain gases which produce on its surface the unchangeable magnetic or black oxide of iron, has given us a metallic surface unique in tone and texture, which preserves intact all of the original freshness and life of the metallic surface, and which constitutes a perfect protection against rust and other chemical change under all ordinary conditions of inside use. Its brittleness precludes its employment where the work is very delicate or liable to bending, but otherwise it is applicable to all kinds of iron work, either wrought or cast. No one who has not seen iron work treated by this process can fully realize the perfection and beauty of the finish it affords.—*Trefoil.*

Stroud's Self-Basting Roasting Pan.

James Stroud, 1263 Broadway, New York, is offering the trade a self-basting roasting pan which does not require any cover. It consists of two pans, one resting within the other in such a manner as to leave a large space between them. The upper pan, upon which the meat is placed, is provided upon the bottom with a series of stamped ridges, the purpose of which is to elevate the meat from the bottom of the pan, allowing the hot air to pass beneath it, thoroughly browning it on the bottom as well as on the top. It is stated that by this arrangement there is no necessity for turning the meat; in fact, that after placing it in the oven it will require no attention whatever. There is also a row of small holes arranged around the sides of the upper pan. The lower pan forms a receptacle for boiling water wherein the steam is generated, and from which it rises through the small holes in the upper pan, forming a vapor around the meat to keep it moist and to effectually keep it from burning. It is claimed that the steam does the basting, rendering the meat more tender and juicy than is possible by the old method, and that it will roast in about one-third less time than is required when using the old style baking pan.

The Climax Fire Pot.

The accompanying illustrations show general and sectional views of the Climax Fire Pot, that has recently been put on the market by Clarence M. Kemp, Baltimore, Md., who has been experimenting

Fig. 1.—Front View of Pot.

with and testing the device for some time past in perfecting its construction. Referring to the sectional view, Fig. 2, the interior of the pot is of fire clay, which is designed to store and retain the heat. The burner is so arranged that the flame shoots directly on the coppers when entering the fire pot and then rolls around the sides of the pot and again comes in contact with the coppers. This motion of the flame is due to the shape of the fire pot, as will be clearly understood by referring to Fig. 1, which shows a front view of the device. It will be seen in the illustrations that the front of the pot is arranged so that if desired a pipe can be easily run to carry off the products of combustion.

The fire pot can be heated with either city or gasoline gas, but must be used in

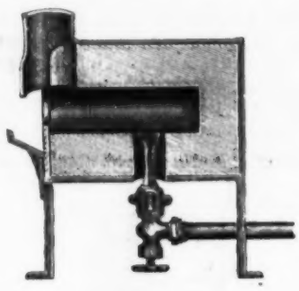


Fig. 2.—Sectional View of Pot.

conjunction with an air blast. For this purpose the Climax Automatic Air Blast is offered by the same manufacturers, as shown in Fig. 3. This blast, which is intended for fire pots as well as other purposes, compresses air without steam power or labor, a supply of water being the only requirement. When attached to the water pipe and the water cock opened a strong air blast is produced. The appliance can be set on a bracket or bench, or wherever desired. Referring to the illustration, A is the body of the blast, B regulating

Fig. 3.—The Climax Automatic Air Blast.

screw for the water, C water cock, D inlet for air, E outlet for compressed air, F waste-water outlet. The operation of this device is very simple. The water, entering through the pipe C, sucks in air through D, and as the reservoir fills, increasing pressure is given to the air. Finally the water reaches a constant level and overflows at F, the air which is continually drawn in through D keeping up the pressure. The box on the side beneath F, as shown in the cut, forms a seal or trap, so no air can escape along with the water. This blast is intended for a variety of purposes, wherever air pressure is required, for packers, can manufactories, jewelers, machinists, tinners, dentists and others.

Cleveland Scorcher, No. 4.

H. A. Lozier & Co., Cleveland, Ohio, are putting this wheel on the market, as illustrated herewith. Both wheels are 28 inches in diameter, having 2-inch Palmer pneumatic tires. The handle bar is 40 inches in length, so made on account of the extra long wheel base. The machine is made with single diamond tubular frame and lightened saddle, whereas their other bicycles have double diamond frame. This is referred to as a very light wheel, weighing from 32 to 34 pounds, geared to 60 inches.

Cleveland Scorcher No. 4.

Leggett's Dry Powder Gun.

Leggett & Brother, 301 Pearl street, New York, are offering the above article, as illustrated in Fig. 1. It consists of a tube, on the top of which is a receptacle for holding dry powder, such as Paris green, London purple, &c. Back of this is a rotary fan operated by the crank and gearing. The receptacle is provided with a fine sieve near the bottom, below which are three small holes, allowing the powder to drop into the tube and be blown out by the current of air caused by the revolving fan. Above the sieve is an agitator, which is connected with the front wheel by a rod, and is in motion when the fan is revolving. A sliding gauge immediately under the rod allows the quantity of powder discharged to be increased or diminished as desired. The receptacle holds 1 quart of powder, and has a large and convenient screw-cap on the top. The gun as shown in Fig. 1 is 26 inches long, and additional tubes 1 inch in diameter, as shown in Fig. 2, are provided, which when attached makes the whole length 7 feet, the gun complete weighing 4½ pounds. A loop is attached back of the fan, which may be slipped into a belt at the waist, and allows the gun to be pointed at any desired angle. Another loop is attached to the back of the powder receptacle, to which a strap around the neck may be fastened. It is pointed out that the use of straps is necessary only when the gun is in continuous use for a long time, as they relieve the hand of the weight of the gun. The fan makes 1500 revolutions a minute, and the powder is thrown from 3 to 5 feet beyond the nozzle of the gun. The gun is designed to distribute Paris green, London purple, hellebore, insect powder, lime, plaster, flour, &c., on plants, trees and shrubbery. It is referred to as being a rapid and effective manner of distributing insecticides in a dry form, at the same time avoiding the weight of insecticides when used in liquid form. The gun is made of the best material and in a substantial manner.

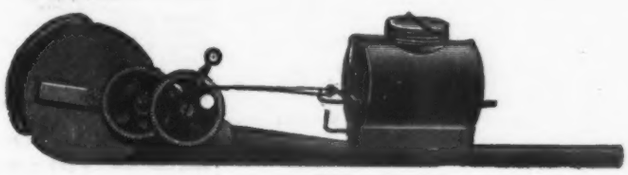


Fig. 1.—Leggett's Dry Powder Gun.

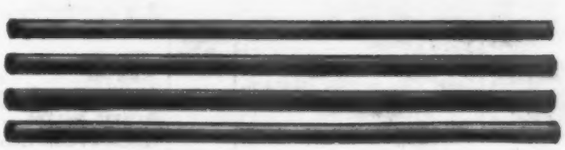


Fig. 2.—Extension Tubes for Powder Gun.

The Hudson River freight and passenger boats have been put in commission for the season.

Bull Dog Bag Tie.

Buffalo Specialty Mfg. Company, Buffalo, N. Y., are introducing this article, as illustrated in Fig. 1. The manner in which the tie is used is shown in Figs. 2 and 3. The quickness with which the tie is fastened and the tenacity with which it holds are referred to as advantages arising from the use of the tie. It is stated that it is impossible for the tie to let go until the operator so desires, when it is only necessary to pull the piece of metal and the bag is released. It is pointed out that by its use many dollars will be saved by preventing losses resulting from bags being improperly tied, at the same time obviating the necessity of cutting the string and of possibly cutting the bag at the same time.

Fig. 1.—Bull Dog Bag Tie.

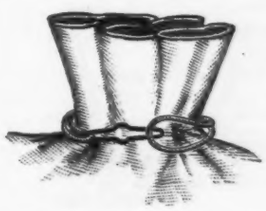


Fig. 2.—Operation of Tying.

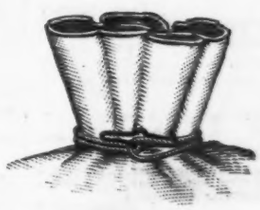


Fig. 3.—The Position when Tied.

CURRENT HARDWARE PRICES.

APRIL 6, 1892.

Note.—The quotations given below represent the current Hardware Prices which prevail in the market at large. They are not given as manufacturers prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Adjusters, Blind.
Domestic.....₩ doz $3.00, 33⅓%
Excelsior.....₩ doz $10.00.....50&10&2%
North's.....list net @10%
Zimmerman's—See Fasteners Blind.

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils.—
Eagle Anvils, ₩ ℔ 10¢.....15@15&5%
Peter Wright's.....11@11½¢
Armitage's Mouse Hole.....10½@11¢
Am. Wrought, Horseshoe and.11@11½¢
Trenton.....10@10½¢
Wilkinson's.....10½@11¢
Moore & Barnes Mfg. Co.....33⅓%

Anvil Vise and Drill—
Millers Falls Co., $18.00.....20%
Chenoy Anvil and Vise.....25%
Allen Anvil and Vise, $3.00.....40&10%
Star.....45&5%

Apple Parers—See Parers, Apple, &c

Augers and Bits—
Douglass Mfg. Co.....
Wm. A. Ives & Co.....
Humphreysville Mfg. Co.....
French, Swift & Co. (P. H. Beecher, P. S. & W. Co.....
Rockford Bit Company.....
Cook's, Douglass Mfg. Co.....55%
Cook's, N. H. Copper Co.50&10&50&10&5%
Ives' Circular Lip.....60%
Patent Solid Head.....30%
C. E. Jenning & Co., No. 10, extension lip.....40%
C. E. Jennings & Co., No. 30.....60%
C. E. Jennings & Co., Auger Bits, ₩ set, 32⅝ quarters. No. 5, $5; No. 30, $3.50.20%
Lewis' Patent Single Twist.....45%
Russell Jennings' Augers and Bits.25&10%
Imitation Jennings' Bits.....60@60&10%
Pugh's Black.....30%
Pugh's Jenning's Pattern.....40%
Car Bits.....60@60&10%
Car Bits, P. S. & W. Co.....60&10%
Snell's Car Bits.....60%
L. Hommedieu Car Bits.....15&10%
Forstner Pat. Auger Bits.....20%
Cincinnati Bell-Hangers' Bits....30&10%

Bit Stock Drills—
Morse Twist Drills.....50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30@30&5%
Cincinnati, for wood.....30&10%
Cincinnati, for metal.....45&10%

Expansive Bits—
Clarks' small, $18; large, $26..35@35&10%
Ives' No. 4, ₩ doz $60.....40%
Swan's.....40%
Steer's, No. 1, $26; No. 2, $22.....35%
Stearns' No. 2, $48.....20%

Gimlet Bits—
Common.....₩ gross $2.75@$3.25
Diamond.....₩ doz $1.25.....4 &10%
See.....25@25&5%
Double Cut, Shepardson's....45@45&10%
Double Cut, Ct. Valley Mfg. Co....30&10%
Double Cut, Hartwell's, ₩ gro.....$5.25
Double Cut, Douglass'.....40&10%
Double Cut, Ives'.....60@60&10%

Hollow Augers—
Ives.....
French, Swift & Co.....} 33⅓&10%
Douglass'.....
Bonney's Adjustable, ₩ doz $48....40&10%
Stearns'.....20&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20%
Wood's.....15@25&10%
Cincinnati Adjustable.....25&10%
Cincinnati Standard.....25&10%

Ship Augers and Bits—
L'Hommedieu's.....15&10@15&10&5%
Watrous'.....15&10@15&10&10%
Snell's.....15&10@15&10&5%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10@5%

Awl Hafts—See Hafts, Awl.

Awls—
Awls, Sewing, Common.....₩ gr. 85¢@90¢
Awls, Should. Peg.....₩ gr. $1.50@$1.55
Awls, Pat. Peg.....₩ gr. 35¢@38¢
Awls, Shouldered Brad..₩ gr. $1.20@1.40
Awls, Handled Brad...₩ gr. $2.50@$3.00
Awls, Handled Scratch..₩ gr. $4.00@4.50
Awls, Socket Scratch..₩ doz. $1.10@$1.20

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

	Plain.	Beveled.
First quality, best brands	$7.00 @	$7.50
First qual., other brands	6.62½ @ 6.75	
Second quality	6.00	6.50

Axle Grease—See Grease, Axle.

Axles—
No. 1...3½@4½¢, No. 2, 5¢@6¢.....
Nos. 7 to 14.....60&10%
Nos. 15 to 18.....47½%
Nos. 19 to 22.....70%
Concord Axles, loose collar.....2½@3¢
Concord Axles, solid collar.....5½@7¢
National Tubular Self-Oiling.....
} 3% cash
33⅓&33⅓&5%

Bag Holders.—See Holders, Bag.

Balances—
Spring Balances.....40%

	No. 2000	20	50
Chatillon, ₩ doz...	$0.80	0.95	1.75 net

Chatillon Straight Balances.....40%
Chatillon Circular Balances.....50&10%

Barb Wire.—See Wire, Barb.

Bars.
Crow—
Cast Steel.....₩ ℔ 3½¢
Iron, Steel Points.....₩ ℔ 3¢

Basins, Wash—
Standard Fiberware, No. 1, 10½-inch, $2; 12-inch, $2.25; 13½-inch, $2.75; 15-inch, $3.25.

Beams, Scale—
Scale Beams, List Jan. 12, '82...50&10@50&10&5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50%
Custer's.....33⅓%

Beaters—
Egg—
Dover.....₩ doz $1.50
Duplex (Standard Co.).....₩ doz $1.25
Rival (Standard Co.).....₩ doz $1.00
Duplex Extra Heavy (Standard Co.)..... ₩ doz $5.50
Bryant's.....₩ gro $14.00
Double (H. & R. Mfg. Co.), ₩ gro. No. 0, $12.00; No. 1, $15.00; No. 2.....$36.00
Easy (H. & R. Mfg. Co.).....₩ gro $12.00
Triple (H. & R. Mfg. Co.).....₩ gro $16.50
Spiral.....₩ gro $4.25 @ 4.50
Improved Acme (H. & R. Mfg. Co.)..... ₩ gro $9.00
Paine, Diehl & Co.'s.....₩ gro $24.00
Silver & Co.....₩ doz $5.50
Culinary—
Keystone, P.D.&C., Each, No. 1, $1; No. 2, $2.....20%

Bells—
Cow—
Common Wrought.....60&10%
Western, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Kentucky, Sargent's list.....70&10%
Kentucky Durham.....70&10%
Dodge, Genuine Kentucky....70@70&10%
Texas Star.....50&10@50&10&5%
Door—
Gong, Abbe's.....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barton's.....40&10@50%
Crank, Taylor's.....25&10%
Crank Brooks'.....50&10&2%
Crank Cone's.....10%
Crank, Connel's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned.....25&10%
Lever, R. E. M. Co.'s.....50&10&2%
Pull, Brook's.....50&10&2%
Electric,
Wollensak's.....20%
Bigelow & Dowse.....20%
Taylor's.....20%
Hand—
Light Brass.....70&10%
Extra Heavy.....70
White.....70%
Silver Chime.....33⅓&10%
Globe Cone's Patent).....25&10@35%
Miscellaneous—
Call.....40@40&5%
Farm Bells.....₩ ℔ 3¢@3½¢
Steel Alloy Church and School Bells..40%

Bellows—
Blacksmiths'.....60&10@60&10&5%
Holders'.....40&10@50%
Hand Bellows.....40&10@50%

Belting, Rubber—
Common Standard.....70@1'@75&5%
Standard.....70@5@70&10%
Extra.....6'@10@60&10@5%
N.Y.B.&P.Co., Carbon.....60%
N.Y.B.&P.Co., Diamond.....50%
N.Y.B.&P.Co., Para.....40%

Beach Stops—See Stops, Beach.

Benders and Upsetters, Tire.
Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%

Bits—
Auger, Gimlet, Bit Stock Drills, &c., see Augers and Bits.
Bit Holders—See Holders.
Blind Adjusters—See Adjusters, Blind.
Blind Fasteners—See Fasteners, Blind.
Blind Staples—See Staples, Blind.

Blocks—
Ordinary Tackle, list May 20, 1889... See Trade Report
Cleveland Block Co., Mal. Iron.....50%
Moore's Novelty, Mal. Iron.....50%
Sure Grip Steel Tackle Blocks.....25%

Boards, Stove.
Wood Lined Crystal.....50%
Oxidized.....45%
Embossed.....50%
Paper Lined Zinc.....55%
Crystal.....55%
Embossed.....55%
New Tacoma.....55%

Bolts—
Carriage, Machine, &c.—
Com. list June 10, '84.....75&10&2%
Genuine Eagle, Norway, list Oct., '84... 80@80&10%
Phila. pattern, list Oct. 7, '84..75@75&10%
R.B.&W., old list.....70%
Machine, list Jan. 1, 1890.....80@80&5%
Bolt Ends, list Jan. 1, 1890.....75&10@75&10&5%
Door and Shutter—
Cast Iron Barrel, Square, &c.....70&10%
Cast Iron Shutter Bolts.....70&10%
Cast Iron Chain (Sargent's list)....65&10%
Ives' Patent Door Bolts60&10@60&10&5%
Wrought Barrel.....70@70&10%
Wrought Square.....70@70&10%
Wr't Shutter, all Iron, Stanley's..60&10%
Wr't Shutter, Brass Knob, " ..40&10%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list....55&10%
Wr't Sunk Flush, Stanley's list....50&10%
Wr't S.K.Flush. Corn'n " ..75&10%

Stove and Plow—
Stove.....60%
Plow.....60&5%
R. B. & W., Plow.....55%
Tire—
Common, list Feb. 28, '83.....65%
Port Chester Bolt and Nut Company:
Empire, list Feb 28, '83.....65%
Keystone, Philadel., list Oct. '84....80%
Norway, Phila., list Oct. '84.....75%
American Screw Company:
Norway, Phil., list Oct. 16, '84.....75%
Eagle, Phil., list Oct. 16, '84.....80%
Philadel., list Oct. 16, '84.....80%
Bay State, list Feb. 28, '83.....65%
R.B.&W., Philadel., list Oct. 16, '84....80%

Borers, Tap.
Common and Ring.....20&10%
Ives' Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20&10&30%
Clark's.....33⅓@35%

Borax.....₩ ℔ 9½@10½¢

Boring Machines—See Machines, Boring.

Bow Pins—See Pins, Bow.

Boxes, Wagon.
Per ℔.....2½¢

Braces.—
American Bit Brace Co.:
Nos. 10, 12, 20.....60&10%
Nos. 11, 21, 24, 27.....70&10%
Nos. 22, 23, 25.....60&10&5%
Nos. 13, 26, 36, 37.....70&10&5%
Ball Braces, net.....$1.12 to $1.25¢
Amidon's
Barker's Imp'd Plain.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet.....75&10@80%
Eclipse Rachet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10; 10 in.....$2.25
Buffalo Ball.....$1.10@$1.1
Barber's,
Nos. 10 to 16.....50@50&10%
Nos. 30 to 33.....50@50&10%
Nos. 40 to 63.....50&10@50&10&5%
Saxton's,
Barker's Imp. Polished.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet, Polished.....50&10@60%
Ratchet, Nickeled.....40&10@50%
Buffalo Ball.....net, $1.10@$1.75
Bartholomew's,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Common Ball, American.....$1.00@$1.10
Fray's Genuine Spofford's..50&5@50&10%
Fray's No. 70 to 120, $1 to 123, 207 to 414.....50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....60&5@60&10%
Barbers.....60&5%
Spofford.....60&5@60&10%
Osgood's Ratchet.....40&10@50%
P. S. & W. Co., Peck's Patent.....60%

Brackets—
Shelf, plain.
Regular list.....65@70%
Sargent's list.....66⅔@66⅔&10%
Shelf, fancy.
Sargent's list.....66⅔@66⅔&10%
Other makes at a wide range of prices.

Bright Wire Goods—See Wire.

Broilers—

Henis' Self-Basting.	Inch	9	10	9x11
	Per doz	$4.50	5.50	6.50

New Haven.....50%
Wire Goods Co.....65&10%
Morgan Odorless.....₩ doz $12, 33⅓%

Buckets, Well.
Galvanized—
Hill's.....₩ doz, 12 qt, $4.25; 14 qt, $5.25
Iron Clad.....₩ doz. 14 qt, $4.25@$4.50
Helwig's Flat Iron Band.....$3.75
Helwig's Wired Top.....₩ doz $4.00

Bull Rings—See Rings, Bull.

Butchers' Cleavers—See Cleavers Butchers'.

Butts—
Brass—
Wrought Brass.....80@80&10%
Cast Brass, Tiebout's.....50%
Cast Brass, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%
Cast Iron—
Fast Joint, Narrow.....50&10&5@60%
Fast Joint, Broad.....50&10@60%
Loose Joint.....
Loose Joint, Japanned.....
Loose Joint, Jap. with Acorns.....
Parliament Butts.....
Mayer's Hinges.....
Loose Pin, Acorns.....
Loose Pin, Acorns, Japanned.....
Loose Pin, Acorns, Japanned, Plated Tips.....
} ..70&10 @75%
Wrought Steel—
Fast Joint, Narrow.....
Fast Joint, Lt. Narrow.....
Fast Joint, Broad.....
Loose Joint, Broad.....
Table Butts, Back Flaps, &c.....
Inside Blind, Regular.....
Inside Blind, Light.....
Loose Pin.....
} ,70&10 @75%
Bronzed Wrought Butts.....50%

Calipers—See Compasses.

Calks, Toe—
Gautier, One Prong, Blunt.....5½@6¢
Burke's, One Prong, Blunt.....5½@6¢
Burke's, Two Prong, Blunt.....7½@8¢
Burke's, One Prong, Sharp.....6½@7¢

Can Openers—See Openers Can.

Caps—
Percussion, ₩ 1000—
Hicks & Goldmark's and Union Metallic Cartridge Co.
F. L. Waterproof, 1-10's.....35@37¢
E. B. Trimmed Edge, 1-10's.....47@50¢
E. B. Grad. Edge, Cent. Fire, 1-10's.....47@50¢
Musket Waterproof, 1-10's.....50@55¢
G. D.....27@30¢
A. B. Genuine Imported.....45¢
Eley's E. B.....50¢ @ 55¢
Eley's D Waterproof, Central Fire...$1.00
Primers—
Berdan Primers, $1.00.....2%
U. L. Caps (for Sturtevant Shells) $1.00.....2%
All other Primers, $1.30.....3%

Cards—List January 28, 1891.
Watson's Cotton, Wool, Horse and File.....1.....33%

Carpet Stretchers—See Stretchers Carpet.

Carpet Sweepers—See Sweepers Carpet.

Cartridges—
Rim Fire Cartridges.....50&5&2%
Rim Fire Military.....15&2%
Cent. Fire, Pistol and Rifle.....25&5&2%
Cent. Fire, Military and Sporting 15&5&2%
Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.
Blank Cartridges, 22 cal., $1.75.....3%
Blank Cartridges, 32 cal., $3.50.....3%
Primed Shells and Bullets.....15&5&2%
B. B. Caps, Round Ball, $1.75.....2%
B. B. Caps, Con. Ball, Bwgd., $2.00.....2%

Casters—
Bed.....
Plate.....} Brass....55@55&10%
Shallow Socket.....} Others...50@50&10%
Deep Socket.....40&10%
Yale Casters, list May, 1884...30&10@40%
Yale, Gem.....60@60&5%
Martin's Patent (Phœnix).....45&10@50%
Payson's Anti-friction.....70%
Payson's Truck.....70%
Giant Truck Casters.....30%
Stationary Truck Casters.....50&10%
Socket Truck Casters.....50%

Cattle Leaders—See Leaders, Cattle.

Cement.
Victor Elastic.....5 ℔ pails ₩ ℔ 5¢

Chain—
Trace, Wagon and Fancy Chains, List revised April 21, 1890.....60@60&10%
American Coil, in cask lots.

3-16	¼	5-16	⅜	7-16	½	⅝	¾
$7.00	5.45	4.45	3.80	3.65	3.50	3.40	3.35

Less than cask lots, add ½¢@1½¢ ₩ ℔.
German Coil, list Oct. 6, 1890...60@60&5%
German Halter Chain, list Oct. 6, 1890 60@60&5%
Covert Halter.....60&2%
Covert Traces.....35&2%
Covert Heel Chain.....50&2%
Oneida Halter Chain.....60@60&5%
Galvanized Pump Chain.....₩ ℔ 8½¢@9¢
Jack Chain, Iron.....75&10@80%
Jack Chain, Brass.....75@75&10%

Chalk—
White, case lots, ₩ gr 50¢; small lots 55 @55¢
Red, case lots...₩ gr 67¢; small lots 77 @78¢
Blue, case lots...₩ gr 75¢; small lots 85¢ See also Crayons.

Chalk Lines—See Lines.

Chisels—
Socket Framing and Firmer.
P. S. & W.....
New Haven.....
Witherby.....
Mix.....
Ohio Tool Co.....
} ..75 @ 75&10%
Douglass.....75@75&5%
Buck Bros.....30%
Merrill.....60&10@60&10&5%
L. & I. J. White.....50@50&5%
Tanged and Miscellaneous.
Tanged Firmers.....40&10@50%
Butchers'.....$4.75@$5.00
Spear & Jackson's.....$5 to $
Buck Bros.....30%
Cold Chisels, ₩ ℔.....15@16%

Chucks—
Beach Pat.....each, $8.00.....20%
Morse's Adjustable, each, $7.00, 20@30&5%
Danbury.....each, $6.00, 30@30&5%
Syracuse, Bals Pat.....25%
Graham Patent.....33⅓%
Skinner's Patent Chucks.
Combination Lathe Chucks.....33⅓%
Universal Lathe Chucks.....40%
Independent Lathe Chucks.....40%
Drill Chucks.....15%
Union Mfg. Co.,
Victor.....$3.50, 25%
Combination.....40%
Universal.....40%
Independent.....40%

Churns.
Tilton Union, each, 5 gal. $3.25; 7 gal. $3.75; 10 gal. $4.25.
McDermaid Star Barrel Churn, each 6 gal., $3.60; 10 gal., $3.75 15 gal. 3.90 20 gal., 3.25.

Clamps—
B. I. Tool Co.'s Wrought Iron.....25%
Adjustable, Cincinnati.....15&10%
Adjustable, Hammers.....15%
Adjustable, Stearn's.....30@30&10%
Stearn's Adjustable Cabinet and Corner.....30@30&10%
Cabinet, Sargent's.....60%&10%
Carriage Makers', Sargent's.....70&10%
Carriage Makers', P., S. & W. Co..40&10%
Eberhard Mfg. Co.....40&5@40&10%
Warner's.....40&10@40&10&5%
Saw Clamps, see Vises, Saw Filers'.
Carpenters', Cincinnati.....25&10%

Cleavers.
Butchers'.
Bradley's.....35@30%
L. & I. J. White.....20&5%
Beatty's.....40@40&5%
New Haven Edge Tool Co.'s.....40%
P., S. & W.....33⅓&5@33⅓&10%
Foster Bros.....30%
Schulte, Lohoff & Co.....40@40&5%

Clips—
Norway, Axle, ¼ & 5-16.....55&5&5%
2nd grade Norway Axle, ¼ & 5-16. 65&5%
Superior Axle Clips.....60%&5@70%
Norway Spring Bar Clips, 5-16..60&5&5%
Wrought-Iron Felloe Clips.....₩ ℔, 5½¢
Steel Felloe Clips.....₩ ℔, 5¢
Baker Axle Clips.....25%

Cloth and Netting, Wire—See Wire, &c.

Cockeyes.....50%

Cocks, Brass.
Hardware list.....50&2%

Coffee Mills—See Mills, Coffee

Collars, Dog, &c.
Medford Fancy Goods Co.....40&10%
Embossed, Gilt, Pope & Steven's list 30&10%
Leather, Pope & Steven's list.....40%
Brass, Pope & Steven's list.....40%
Chapman Mfg. Company.....50&10@60%

Combs, Curry.
Fitch's.....50&10@50&10&10%
Rubber, per doz $10.00.....20%
American Curry Comb Co.....Net prices

Compasses, Dividers, &c.—
Compasses, Calipers, Dividers.70@70&10%
Bemis & Call Co.'s
Dividers.....60&5%
Compasses & Calipers.....50&5%
Wing and Inside or Outside.....50&5%
Double.....60%
(Call's Pat. Inside).....30%
Excelsior.....50%
J. Stevens & Co.'s.....35&10%
Starrett's
Spring Calipers and Dividers....25&10%
Lock Calipers and Dividers.....25%
Combination Dividers.....25%

Coopers' Tools—See Tools, Coopers'.

Cord—
Sash.
Common.....₩ ℔, 10¢ @ 11¢
Patent, good quality.....₩ ℔, 12 @ 12¢
White Cotton Braided, fair.₩ ℔, 24¼@25¢
Common Russia Sash.....₩ ℔, 12¾@13¢
Patent Russia Sash.....₩ ℔, 14¢
Cable Laid Italian Sash.....₩ ℔. 21@22¢
India Cable Laid Sash.....₩ ℔, 12¢
Silver Lace—
A Quality, White, 50¢.....25 %
A Quality, Drab, 55¢.....25 %
B Quality, White, 30¢.....10 %
B Quality, Drab, 35¢.....10 %
Sylvan Spring. Extra Braided White,34¢
Sylvan Spring, Extra Braided, Drab..39¢
Semper Idem, Braided, White.....30¢
Egyptian, India Hemp, Braided.....26¢
Massachusetts, White.....26¢
Samson—
Braided, White Cotton, 50¢..30@30&5%
Braided, Drab Cotton, 55¢..30@30&5%
Braided, Italian Hemp, 55¢..30@30&5%
Braided, Linen, 80¢.....30@30&5%
Tate's Cotton Braided, White.₩ ℔,28¢.10%
Wire Picture.
Braided or Twisted.....75&10%

Corkscrews—See Screws, Cork.

Corn Knives and Cutters—See Knives, Corn.

Crackers, Nut—
Table (H. & B. Mfg. Co.).....40%
Blake's Pattern.....₩ doz $2.00, 10%
Turner & Seymour Mfg. Co.....50%

Cradles—
Grain.....50&5&2@50&10&2%

Crayons.
White Crayons, ₩ gross.....10¢
D. M. Stewart Mfg. Co., Metal Workers, ₩ gr, $2.50.....25%
D. M. Stewart Mfg. Co., Rolling Mill, ₩ gr, $2.50.....25%
See also Chalk.

Crow Bars—See Bars, Crow.

Curry Combs—See Combs, Curry.

Curtain Pins—See Pins Curtain.

Cutters—
Meat.
Dixon's ₩ doz.....40&5%
Nos.....1 2 3 4
$14.00 $17.00 $19.00 $40.00
Woodruff's ₩ doz.....40&5%
Nos.....100 150
$15.00 $18.00
Hales Pattern ₩ doz.....70@70&5%
Nos.....11 12 13
$27.00 $33.00 $45.00
American.....30%
Nos.....1 2 3 4 B 5
Each.....$5 $7 $10 $25 $50 $60
Enterprise.....30%
Nos.....10 12 22 32 42
Each.....$3 $2.50 $4 $6 $15
Great American Meat Cutter.....30%
Nos.....112 116 118 120 122
Each.....$2.00 $2.75 $3.00 $2.50 $4.00
Miles' Challenge ₩ doz.....45@45&10%
Nos.....1 2 3
$22.00 $30.00 $40.00
Home No. .....₩ doz $26.00, 55&10%
Draw Cut, each:
Nos..5 2 6 8
$50 $75 $80 $225 .....20@20%
Beef Shavers (Enterprise).....20&10@30%
Little Giant (P. S. & W. Co.).....50%
Chadborn's Smoked Beef Cutter, ₩ doz $66.00
Tobacco.
Champion.....20&10@20%
All Iron.....₩ doz $4.25
Nashua Lock Co.'s..₩ doz, $18.00 50@55%
Wilson's.....55%
Sargents's.....₩ doz, $24, 55&10%
Acme.....₩ doz $20.00, 40%
Washer.
Smith's Pat.....₩ doz $12.00, 20&10&10%
Johnson's.....₩ doz $11.00, 33⅓%
Penny's.₩doz Pol. $14; Jap'd, $16.00, 55%
Appleton's.....₩ doz $16.00, 60&10%
Bonney's.....30&10%
Cincinnati.....25&10%

Dampers, &c—
Dampers, Buffalo.....40&10%
Buffalo Damper Clips.....40&10%
Crown Damper.....40%
Excelsior.....40&10%

Diggers, Post Hole, &c.—
Samson Post Hole Digger, ₩ doz $36.00, 25%
Fletcher Post Hole Augers, ₩ doz $36, 20%
Eureka Diggers.....₩ doz $12.50@14.00
Leed's.....₩ doz $8.00@9.00
Vaughan's Post Hole Auger, ₩ doz $13.00@14.00
Kohler's Little Giant.....₩ doz. $18.00
Kohler's Hercules.....₩ doz.$?.00
Kohler' New Champion.....₩ doz. $9.00
Schniedler.....₩ doz. $18.00
Ryan's Post Hole Diggers..₩ doz $24.00
Cronk's Post Bars, ₩ doz $60.00, 50&5&10%
Gibbs Post Hole Digger.....₩ doz $15.00
Imperial.....₩ doz $7.50
Shimer's Hollow Handle,₩ doz, $24..50%

Dividers—
See Compasses.

Dog Collars—See Collars, Dog, &c.

Door Springs—See Springs, Door.

Drawers.
Money, ₩ doz.....$18&$20

Drawing Knives—See Knives, Drawing.

Drills and Drill Stocks—
Blacksmiths'.....each $1.75
Blacksmiths' Self-Feeding, each $7.50,20%
Breast, P. S. & W.....40&10%
Breast, Wilson's.....30&5%
Breast, Millers Falls.....each $3.00, 25%
Breast, Bartholomew's....each $2.50, 25&10@40%
Ratchet, Merrill's.....30@20&5%
Ratchet, Ingersoll s.....25%
Ratchet, Parker's.....30@20&5
Ratchet, Whitney's.....20&10%
Ratchet, Weston's.....30@25%
Ratchet, Moore's Triple Action..25@30%
Ratchet, Curtis & Curtis.....30%
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00.....20&10%
Wilson's Drill Stocks.....10%
Automatic Boring Tools.....$1.75@$1.85
Twist Drills—
Cleveland.....50&10&5%
Diamond, W. & B.....50&10&5%
Graham's Pat. Groove Shank 50&10&5%
Morse.....50&10&5%
New Process.....50&10&5%
Standard.....50&10&5%
Syracuse (Metal list).....50&10%

Drill Bits or Bit Stock Drills—See Augers and Bits.

Drill Chucks.—See Chucks.

Dripping Pans—See Pans, Dripping.

Drivers, Screw.
Douglas Mfg. Co.....20@20&10%
Disston's.....50%
Buck Bros.....30%
Stanley R. & L. Co.'s
No. 64, Varnished Handles.....65&10%
No. 86.....70&10%
Sargent & Co.'s
No. 1 Forged Blade.....60&10&10%
Nos. 20, 30 and 60.....66⅔&10&10%
P. S. & W.....70 %
Knapp & Cowles:
No. 1.....60&20@70%
No. 2.....60&10&10@70&5%
No. 3.....60&5@60&10%
Nos, 4 and 00, Acme and Ideal..50& 5@50&10&5%
Stearns'.....25&10&5%
Gay & Parsons.....35%
Champion.....25&10%
Clark's Pat.....30@33⅓%
Crawford's Adjustable.....30%
Ellrich's Socket and Ratchet..25@25&10%
Allard's Spiral, new list.....25%
Kolb's Common Sense ₩ doz $6.00,25&10%
Syracuse Screw-Driver Bits...30&30&5%
Screw-Driver Bits.....₩ doz. 50@75¢
Screw-Driver Bits, Parr's.....₩ gro $6.25
Fray's Hol. Hdle. Sets. No. 2. $12.00, 25@25&10%
P. D. & Co.'s all Steel.....50%
Cincinnati.....25&10%
Brace Screw Drivers.....25&10%
Buck Bros.' Screw-Driver Bits.....

Egg Beaters.—See Beaters, Egg.

Egg Poachers.—See Poachers, Egg.

Electric Bell Sets.—See Bells, Electric.

Emery.—No. 4 to No. 54 to Flour,CF

	46 gr.	150 gr.	F. FF.
Kegs, ₩ ℔.....4½¢	5 ¢	2½¢
½ kegs, ₩ ℔...4½¢	5½¢	2½¢
¼ kegs, ₩ ℔...5 ¢	5½¢	3 ¢
10-℔ cans, 10 in case.....6 ¢	6½¢	5 ¢
10-℔ cans, less than 10.....10	10 ¢	

Enameled and Tinned Ware See Ware, Hollow.

Escutcheon Pins—See Pins, Escutcheon.

Escutcheons.
Door Lock....Same dis as Door Locks.
Brass Thread.....60@60&10%
Wood.....25%

Expanded Metal.
List No. 5.
Lathing.....10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Extractors, Lemon Juice—See Squeezers, Lemon.

Fasteners, Blind—
Mackrell's, ₩ doz. $1.00.....20@20&10%
Van Sand's Screw Pat., $15 ₩ gr..60&10%
Van Sand's Old Pat., $15.00 ₩ gr..55&10%
Austin & Eddy No. 2008 ₩ gr.....$9.00
Security Gravity, ₩ gr.....$9.00
Zimmerman's.....45 %

Faucets,—
Fenn's.....40%
Bohren's Pat. Rubber Ball.....25%
Fenn's Cork Stops.....33⅓%
Star.....60%
Frary's Pat. Petroleum.....40&5&2%
B. & L. B. Co.
West's Lock, Open and Shut Key...50%
Star, Metal Plug, new list.....40%
Lockport, Metal Plug, reduced list..60%
Metallic Key, Leather Lined....60&10%
60&10&10%
Cork Lined.....70&5@70&10%
Burnside's Red Cedar.....50%
Burnside's Red Cedar, bbl lots....50&10%
John Sommers'
Peerless Best Block Tin Key.....40%
IXL, 1st quality, Cork Lined.....50%
Diamond Lock.....40%
Perfection, Fla. Red Cedar.....50%
Goodenough Cedar.....50%
Boss Metallic Key.....50%
Reliable Cork Lined.....60%
Western Pattern Cork Lined.....50%
Self-Measuring
Enterprise, ₩ doz $36.00.....20&10%
Lane's, ₩ doz $36.00.....25&10%
Victor, ₩ doz $36.00.....25&10%

Felloe Plates—See Plates, Felloe.

Fifth Wheels.—
Derby and Cincinnati.....45&5%
Brewster.....50&5%

Files—
Domestic—
Nicholson Files, Rasps, &c.....
60&10@60&10&5%
Nicholson (X. F.) Files.....60&10&5%
Nicholson's Royal Files (Seconds).....75%
(extra prices on certain sizes)
G. & H. Barnett (Black Diamond).....
60&10@60&10&5%
Arcade.....60&10@60&10&10%
Eagle.....60&10&5@60&10&10%
Other makers, best brands60&10@60&20%
Fair brands.....60&10&10@70&5%
Second quality.....70&10@75&10%
Heller's Horse Rasps.....50&7½@50&10%
McCaffrey's Horse Rasps.....50&10%
Chesing Horse Rasps, Hand Cut, 50&10%
Arcade Horse Rasps.....60 .10%
Imported—
Butcher.....Butcher's list, 20%
Stubs.....Stubs list, 25@30%

Fixtures.
Grindstone—
Sargent's Patent.....70&10%
Reading Hardware Co.....30&10%
P., S. & W. Co.....50&10%

Fluting Machines—See Machines, Fluting.

Fluting Scissors—See Scissors, Fluting.

Fodder Squeezers—See Squeezers, Fodder.

Forks—
Hay, Manure, &c., Asso List. 65&5@65&10%
Hay, Manure, &c., Phila. List. 60@60&5%
Plated, see Spoons.

Frames—
Saw—
White Vermont.....₩ gro $9.00@10.00
Red, Polished and Varnished.....₩ doz $1.50, 25%
Screen, Window and Door—
Porter's Pat. Window and Door Frame. 33⅓&10%
Warner's Screen Corner Irons.. 33⅓@ 33⅓&10%
Stearns' Frames and Corners..25@25&10%
Cortland.....40@40&5%

Freezers, Ice Cream—
White Mountain.....60@60&5%
Granite State.....65@65&5%
Arctic.....70@70&5%
American.....60%
Buffalo Champion.....65@65&5%
Shepard's Lightning.....65@65&5%
Gem.....60%
Blizzard.....70%
Double Action Crown.....60%
Crown.....60%
Star.....60%
Peerless.....60&10%
Giant.....60%
Zero.....60&10%
Boss and Pet.....60&10&10%
Keystone, P. D. & Co., each $1.50.....30%

Fruit and Jelly Presses—See Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.

Funnels.
Gersdorff's Perfection, Standard and Globe; Tin, 1 gro., 10 %; 2 to 5 gro., 20 %; 5 to 10 gro.....30 %
Copper, 1 to 6 doz., 15 %; 6 to 12 doz., 20 %; over 12 doz.....25 %

Furnaces, Soldering.
Burgess No. 3 Gem, tin reservoir....$7.00
Burgess No. Gem, copper reservoir, 8.50
Fuse—Dis. 12½%. ₩ 1000 ft
Common Hemp Fuse, for dry ground..$2.70
Common Cotton Fuse, for dry ground 3.25
Single Taped Fuse, for wet ground.. 3.25
Double Taped Fuse, for very wet gr.. 4.25
Triple Taped Fuse, for very wet gr.. 5.60
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water.12.00

Gates, Molasses—
Stebbin's Pattern.....30@30&5%
Stebbin's Genuine.....60&10&10%
Stebbin's Tinned Ends.....40&10%
Chase's Hard Metal.....50&10%
Bush's.....30%
Lincoln's Pattern.....70@70&10%
Weed's.....30&10%
Boss, ₩ doz:
No. 1, $7; No. 2, $8; No. 3, $9; No. 4, $10.....60&10&10%

Gauges.
Marking, Mortise, &c.....60&10%
Starrett's Surface, Center and Scratch. 25&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge.....20&10%
Wire, Wheeler, Madden & Co.....10%
Wire, Morse's.....25%
Wire, Brown & Sharpe's.....10@20%
Wire, P. S. & W. Co.....10&10

Gimlets—
Nail and Spike.....50&10&5%
"Eureka" Gimlets.....40&10%
"Diamond" Gimlets.....₩ gr $5.00
Double Cut, Shepardson's.....45@45&5%
Double Cut, Ives'.....60@60&5%
Double Cut, Douglass'.....40&10%
"Bee," ₩ gr $12.....25@25&5%

Glue—
Le Page's Liquid.....25@25&5%
Upton's Liquid.....25@
Improved Process.....25@25&5%
Dodd's Liquid Glue.....25@25&5%

Glue Pots—See Pots, Glue.

Grease, Axle.
Fraser's.....Keg₩ ℔ 44, Pail ₩ ℔ 8¢
Fraser's, in boxes.....₩ gr $9.50
Dixon's Everlasting, in bxs..₩ doz 1℔ $1.30; 2 ℔ $2.00
Dixon's Everlasting....10-℔ pails, ea. 85¢
Lower grades, special brands, ₩ gr $5.50@$7.00

Grindstones—
Small, at factory.....₩ ton $7.50@8.00
Family, regular list.....60%
Family, Cleveland Stone Co.....20 %

Grindstone Fixtures—See Fixtures Grindstone.

Hack Saws—See Saws.

Hafts, Awl.
Sewing, Brass Fer.₩ gr, $3.50.....45&10%
Pat. Sewing, Short.$1.00 ₩ doz,.....40&10%
Pat. Sewing, Long.....₩ doz $1.00
Pat. Peg, Plain Top.₩ gr $10.00...45&10%
Pat. Peg, Leather Top.₩ gr $12.00.45&10%

Halters.
Covert's, Rope, Jute.....60&10&10&2%
Covert's, Rope, 7-16-in., Jute.....70&2%
Covert's, Rope, ½-in. Hemp.....50&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Ties. 50&2%
Covert's Jute Horse Ties.....70&2%
Covert's Jute Cattle Ties.....70&10&2%
Covert's Adj. Web Halters.....35&5&2%
E. Covert Mfg. Co.'s Halters.....33⅓%
E. Covert Mfg. Co.'s Horse and Cattle Ties.....33⅓

Hammers—
Handled Hammers—
Maydole's, list Dec. 1, '85.....25&10@35%
Buffalo Hammer Co.,
Humason & Beckley,
Ames Tool Co.,
Verree,.....50@50&10%
C. Hammond & Son.....40&10@—%
Fayette R. Plumb.
Artisans' Choice, A. E. Nail..40&10%
Regular Y. & P., A. E. Nail.....50%
Horseshoe Turning Hammers.....50%
Other Hammers.....50&10%
Cheney's Claw.....40&10%
Cheney's Machinist's & Riveting.50&5%
Hartford, Nail Hammers.....40&2%
Hartford, Machinists, &c...50&5&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.35, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles.....20@25
Peck, Stow & Wilcox.....40%
Sargent's.....33⅓&10%
Heavy Hammers and Sledges—
3 ℔ and under.....₩ ℔40¢
3 to 5 ℔.....₩ ℔36¢ } 70@70&10%
Over 5 ℔.....₩ ℔30¢
Wilkinson's Smiths.....10½¢@11¢₩ ℔

Handcuffs and Leg Irons—See Police Goods,

Handles—
Cross-Cut Saw Handles—
Atkins' No. 1 Loop,₩ pr.,35¢; No 3, 18¢; No. 6, 15¢; No. 2 and No. 4, Reversible, 18¢.
Champion.....18¢
Iron, Wrought or Cast—
Door or Thumb.
Nos.....0 1 2 3 4
Per doz....$0.90 1.00 1.10 1.35 1.50
60&10&
Boggin's Latches.....₩ doz 30¢@3
Bronze Iron Drop Latches..₩ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.62 Plate, $1.10 ; no Plate, $0.88.....net
Barn Door, ₩ doz $1.40.....10&10%
Chest and Lifting.....70%
Wood—
Saw and Plane.....40&10@40&10&5
Hammer, Hatchet, Axe, &c...40@40&5%
Brad Awl.....₩ gr $2.00
Hickory Firmer Chisel, ass'd.₩ gr 4.50
Hickory Firmer Chisel, large.₩ gr 5.00
Apple Firmer Chisel, ass'd...₩ gr 5.00
Apple Firmer Chisel, large...₩ gr 6.00
Socket Firmer Chisel, ass'd..₩ gr 3.00
Socket Framing Chisel, ass'd.₩ gr 5.00
50@50&10%
I. B. Smith & Co.'s Pat File.....50
File, assorted.....₩ gr 2 75
Auger, assorted.....₩ z • 5.00 .....50%
Auger, large.....₩ gr 7.00
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass.....₩ set $1.35
Pat. Auger, Swan's.....₩ set $1.00
Hoe Rake, Shovel, &c.....50&10%

Hangers—

Barn Door, old patterns...60&10&10@70%
Barn Door, New England...60&10&10@70
Samson Steel Anti-Friction..........55%
Orleans Steel..........55%
Hamilton Wrought Wood Track..........55%
U. S. Wood Track..........65%
Champion..........60&10%
Rider and Wooster, Medina Mfg. Co.'s list..........70%
Climax Anti-Friction..........55%
Climax Anti-Friction for Wood Track 55%
Zenith for Wood Track..........55%
Reed's Steel Arm..........50%
Challenge, Barn Door..........50%
Sterling..........50@50&10%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00..........50&2%
Cheritree..........50&10%
Kidder's..........50&10@60%
Boss..........60&10%
Best Anti-Friction..........60&10%
Duplex (Wood Track)..........60&10&5%
Terry's Pat., ⅌ doz pr. 4 in. $10.00; 5 in. $12.00..........50&10%
Terry's Steel Anti-Friction Leader 50&10%
Terry's Steel Anti-Friction Ideal..50&10%
Cronk's Patent, Steel Covered..........50@5%
Wood Track Iron Clad, ⅌ ft. 10¢.....50 &15@60%
Carrier Steel Anti-Friction..........50&10%
Architect, ⅌ set $6.00..........20%
Eclipse..........20&10%
Felix, ⅌ set $4.50..........20%
Richards'..........30@30&10%
Lane's Standard..........50&5@50&10%
Lane's New Standard..........50@50&5%
Lane's Parlor..........40%
Ball Bearing Door Hanger..20&10@25&10%
Warner's Pat..........20&10@20&10&10%
Stearns' Anti-Friction.20&10@20&10&10%
Stearns' Challenge.....25&10@25&10&10%
Faultless..........40@40&5%
American, ⅌ set $6.00..........20&10%
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢..........40%
Paragon, Nos. 1, 2 and 3..........40&10%
Cincinnati..........25&10%
Paragon, Nos. 5, 5½, 7 and 8..........20&10%
Crescent..........60@60&10%
Nickel Cast Iron..........50%
Nickel, Malleable Iron and Steel.....40%
Scranton Anti-Friction Single Strap 33⅓%
Wild West, 4 in. Wheel, $15.00; 5 in. Wheel, $21.00..........45%
Star..........40&10@40&10&5%
May..........50&5@50&10%
Barry, $6.00..........40&10%
Interstate..........50%
Magic..........45%
Pendulum, Payson's..........40%

Harness Snaps—See Snaps.

Hatchets—

American Axe and Tool Co.

Blood's, Hunt's, Hurd's, Mann's, Peck's, Underhill's, Buffalo Hammer Co., Fayette R. Plumb, C. Hammond & Son, Kelly's, Sargent & Co., P., S. & W. Co., Ten Eyck Edge Tool Co.	40 & 10 @ 50&5 %

Collins..........10%
Schulte, Lohoff & Co..........50@50&5%

Hay and Straw Knives—See Knives.

Hinges—

Blind Hinges—

Parker..........75&2%
Huffer..........50%
Clark's, Nos. 1, 3, 5, 40 and 50 75&10&5@80%
Clark's Mortise Gravity..........50%
Sargent's Nos. 1, 3, 5, 11, 13 75&10@55&10&5%
Sargent's, No. 12..........77&10&10%
Reading's Gravity.....75&10@75&10&5%
Shepard's
Noiseless..........75&10%
Niagara..........80%
Buffalo..........80%
Clark's Genuine Pattern..........80%
O. S., Lull & Porter..........75&10%
Acme, Lull & Porter..........75%
Queen City Reversible...70&10&5@75%
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3..........75&10&2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50..........10%

Gate Hinges—

Western..........⅌ doz $4.40, 60%
N. E..........⅌ doz $7.00, 55%
N. E. Reversible......⅌ doz $5.20, 55&10%
Clark's, Nos. 1, 2, 3..........60&10&5%
N. Y. State..........⅌ doz $5.00, 55&10%
Automatic..........⅌ doz $12.50, 50%
Shepard's..........60&10&5%

Spring Hinges—

Geer's Spring and Blank Butts..........40%
Union Spring Hinge Co.'s list, March 1886..........2`%
Barker's Double Acting..........25%
Union Mfg. Co..........25%
Bommer's..........30%
Buckman's..........15@20%
Chicago..........30%
Bardsley's Patent..........40%

Acme	30%	Extra 5@10 % often given.
U. S.	25&10%	
Empire and Crown	20%	
Hero and Monarch	55%	
American, Gem, and Star	20%	
Oxford	20%	
Wiles'	10%	
Devore's	40%	
Rex	40%	
Royal	60%	
Reliable	60%	
Champion	60%	
Stearn's	50&10%	
Samson, ⅌ gross	$14.00	

Wrought Iron Hinges.

List February 14, 1891.
Strap and T..........50&10%

Corrugated Strap & T.....50@50&10%
Screw Hook and Strap — 6 to 12 in., ⅌ ℔. 4¢; 14 to 20 in., ⅌ ℔. 3½¢; 22 to 36 in., ⅌ ℔. 3¢
Screw Hook and Eye — ½ in., ⅌ ℔ 7½¢; ⅝ in., ⅌ ℔ 5½¢; ¾ in., ⅌ ℔ 4½¢
Rolled Blind Hinges, Nos. 32 and 34 50&10%
Rolled Blind Hinges, Nos. 232 and 234 55&10%
Rolled Plate..........70&10%
Rolled Raised..........70&10%
Plate Hinges "Providence" — 8, 10 & 12 in., ⅌ ℔.....5¢; over 12 in., ⅌ ℔.....4¢

Hoes—

Eye—

D. & H. Scovil..........20%
Lane's Crescent Planters Pattern..45&5%
Lane's Razor Blade, Scovil Pattern...30%
Maynard, S. & O. Pat..........45&5%
Sandusky Tool Co., S. & O. Pat. / Am. Axe and Tool Co., S. & O. Pat. — 70@70&5%
Chattanooga Tool Co., S. & O. Pat..60& 5@60&10%
Grub..........60&10%

Handled—

Garden, Mortar, &c..........70%
Planter's, Cotton &c..........70%
Warren Hoe..........60%
Magic..........⅌ doz $4.00

Hog Rings and Ringers—See Rings and Ringers.

Hoisting Apparatus—See Machines, Hoisting.

Hollow-Ware—See Ware, Hollow.

Holders.

Bag.

Sprengle's Pat..........⅌ doz $18.....60%

Bit.

Extension,
Barber's, ⅌ doz $15.00..........40@40&10%
Ives, ⅌ doz $20.00..........60&5@60&10%
Diagonal..........⅌ doz $24.00, 40%
Angular..........⅌ doz $24.00, 40&5%

File and Tool—

Bals Pat..........⅌ doz $4.00; 25%
Nicholson File Holders..........20%
Dick's Tool Holder..........20%

Hooks—

Cast Iron—

Bird Cage, Sargent's list.... / Bird Cage, Reading.... / Clothes Line, Sargent's list.. — 60&10&10%
Clothes Line, Reading list. 60&10@60&10&10%
Ceiling Sargent's list..........55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10@60&10%
Coat and Hat, Reading.50&10@50&10&10%

Wrought Iron—

Cotton..........⅌ doz $1.25
Cotton Pat. (N.Y. Mallet & Handle W'ks). 30%
Tassel and Picture (T. & S. Mfg. Co.)..50%
Wrought Staples, Hooks, &c. See Wrought Goods.

Wire—

Wire Coat and Hat, Gem, list April, 1886..........60@60&10%
Wire Coat and Hat, Miles, list April, 1886..........50@50&10%
Indestructible Coat and Hat...45@45&5%
Wire Coat and Hat, Standard.60@60&10%
Handy Hat and Coat..........50&10@60%
Steady Ceiling Hooks..........50&10@60%
Belt..........80@80&10%
Atlas, Coat and Hat..........60@60&10%
Bright Wire Goods, see *Wire.*

Miscellaneous.

Grass, No. 2, $2.00; No. 3, $2.25; No. 4, $2.50
Nolin's Grass..........⅌ doz $2.25
Bush..........55@60%
Whiffletree—Patent..........55%
Hooks and Eyes—Malleable Iron. 70@70&10%
Hooks and Eyes—Brass..........60&10&10%
Fish Hooks, American..........50%
Bench Hooks..........See Bench Stops.

Horse Nails—See Nails, Horse.

Horse Shoes—See Shoes, Horse.

Hose, Rubber—

Competition..........75@75&10&5%
Standard..........60&10&10@70&10%
Extra..........60@60&10%
N. Y. B. & P. Co., Para..........25&5%
N. Y. B. & P. Co., Extra..........40@40&5%
N. Y. B. & P. Co., Dundee....50&10 @ 60%

Huskers—

Blair's Adjustable..........⅌ gr $8.00
Blair's Adjustable Clipper.....⅌ gr 7.00
Hubbard's Solid Steel..........⅌ gr 4.50

Indurated Fiber-Ware—See Ware, Indurated Fiber.—

Irons.

Sad—

From 4 to 10, at factory....⅌ 100 ℔, $2.30@$2.40
Self-Heating..........⅌ doz $9.00 net
Self-Heating, Tailors'....⅌ doz $18.00 net
Mrs. Pott's Irons..........60@60&10%
Enterprise Star Irons..........60@60&10%
XX Cold Handle Sad Iron.....50&5@60%
Ideal Irons new list.50&10@50 & 10&10%
Salamander, Irons..........25%
B. B. Sad Irons, ⅌ ℔..........3 @3½¢
Combined Fluter and Sad Iron, ⅌ doz, $15.00..........15%
Fox Reversible, Self-Fluter ⅌ doz $24.00
Chinese Laundry (N.E. Butt Co.) 8½¢, 15%
New England..........5¢, 15%
Mahony's Troy Pol. Irons..........25%
Sensible, list Jan. 91..........50&10&5%
Sensible Tailor's Irons..........33⅓%
National Self-Heating..........30%

Soldering—

Soldering Coppers..........⅌ ℔ 19 @ 21¢
Covert's Adjustable, list Jan. 1 1886. 35&2%

Irons, Pinking, per doz., 65¢.

Jack Screws—See Screws.

Jacks, Wagon.

Daisy..........33⅓%
Victor..........33⅓%
Lockport..........40%

Kettles—

Brass, Spun, Plain, list Jan. 1, '91..25&5%
Brass, Spun, Pld. W.M. list Jan. 1, '91.20%
Enameled and Tea—See Hollow Ware.

Keys—

Lock Asso'n list Dec. 30, 1886...50&10@ 60&5%
Eagle, Cabinet, &c..........33⅓&2%
Hotchkiss' Brass Blanks..........40%
Hotchkiss, Copper and Tinned..........40%
Hotchkiss' Pad. and Cab..........35%
Ratchet Bed Keys..........⅌ doz $4.00, 15%
Wollensak Tinned..........50&10%

Knife Sharpeners—See Sharpeners, Knife.

Knives.

Butcher, Shoe, &c—

Wilson's Butcher Knives, List Dec. 8, 1890..........25%
Ames' Butcher Knives..........25%
Foster Bros.' Butcher, &c..........40%
Jordan's AAA1, Butchers', list..........net
Nichols' Butcher Knives..........40&10%
W. W. Wilson, Butcher, 6 in., $2.00; 7 in., $2.70; 8 in., $3.80, &c.
Ames' Shoe Knives..........20@25%
Ames' Bread Knives, ⅌ doz $1.50, 15@20%
Moran's Shoe and Bread..........20%
Hay and Straw..........See Hay Knives.
Table and Pocket..........See Cutlery.
Corn, Auburn Mfg. Co. Western Pat., $2.00
Corn, Auburn Mfg. Co. Crescent....$3.50

Corn—

Bradley's..........10%
Wadsworth's..........25%

Drawing—

Witherby / P. S. & W. / Mix / New Haven — ..75 @ 75&10 %
Merrill..........60&10@60&10&5%
Douglas..........75@75&5%
Watrous..........15&10@25%
L. & I. J. White..........20&5%
Bradley's..........35%
Adjustable Handle..........25@33⅓%
Wilkinson's Folding..........25@25&5%

Hay and Straw—

Lightning, from jobbers....$8.00 @ $9.00
Wadsworth's..........40&7½@40&10%
Carter's Needle.....⅌ doz $11.00@$11.50
Heath's..........⅌ doz $13.00@13.50
Auburn Hay, Com. and Spear Point..50%
Auburn, Straw..........40%
Nolin's Hay..........⅌ doz $7.00 @ $8.00

Mincing.

Am. (2d quality), ⅌ gr., 1 blade, $7; 2 blades, $12; 3 blades, $18..........net
Lothrop's..........20&10%
Smith's, ⅌ doz, Single, $2.00; Double, $3 40@45%
Knapp & Cowles..........50&10@60%
Buffalo Adjustable......⅌ doz $3.00 25%
Buffalo Double Adj'table.⅌ doz $3.00 25%

Knobs—

Door Mineral..........60@65%
Door Por. Jap'd..........70@75%
Door Por. Nickel..........$2.00@2.25
Door Por. Plated, Nickel..........$2.00@2.25
Drawer, Porcelain.....60&10@60&10&10%
Hemacite Door Knobs..........40&10@50%
Yale & Towne Wood, list Dec., 1885...40%
Furniture Plain..........75¢ gro inch, 10%
Furniture, Wood Screws..........25&10%
Base, Rubber Tip..........70&10&5%
Picture, Judd's..........60&10&10@70%
Picture, Sargent's..........70&10%
Picture, Hemacite..........35&5%
Shutter, Porcelain..........65&10%
Carriage, Jap..........⅌ gro 30¢, 60&10%
Bardsley's Wood Door, Shutter, &c..40%

Ladles.—

Melting, Sargent's..........55&10%
Melting, Reading..........35&10%
Melting, Monroe's Pat...⅌ doz $4.00, 40%
Melting, P. S. & W..........35&10@40%
Melting, Warner's..........30%

Lanterns—

Tubular—

Plain with Guards, ⅌ doz.....$3.75@4.00
Lift Wire, with Guards.....$4.00@4.25
Square Plain, with Guards....$3.75@4.00
Sq. Lift Wire, with Guards..........$4.50

Police Lanterns (including packages).

2¾-inch Bull's-eye Police regular..........⅌ doz $3.60
3-inch Bull's-eye Police regular..........⅌ doz $3.90
2¾-inch Bull's-eye Police flash light....⅌ doz $4.00
3-inch Bull's-eye Police flash light....⅌ doz $4.50

Lawn Mowers—See Mowers, Lawn.

Leaders, Cattle.

Humason, Beckley & Co.'s..........70%
Sargent's..........66⅔&10%
Hotchkiss..........30%
Peck, Stow & W. Co..........60&10%

Lemon Squeezers—See Squeezers, Lemon.

Lifters, Transom.

Wollensak's:
Class 3 and 4, Bronzed Iron..........50%
Class 3 and 4, Bronze Metal..........25%
Class 3 and 4, Brass..........35%
Skylight Lifters..........35%
Crown, Eagle and Shield..........50%
Reiher's, list Feb. 20, 1891.
Bronzed Iron Rods..........50&10&10&2%
Brass, Real Bronze or Nickel Plate..30%
Excelsior..........50&10&5%
Shaw's..........50&10%
Payson's:
Universal..........60%
Solid Grip..........60&10%
Imperial..........50&10%

Lines—

Cotton and Linen Fish, Draper's......50%
Draper's and Tate's Chalk..........60%
Draper's Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25..........25%
Cotton Chalk..........55%
Samson Cotton, No. 4, $2; No. 4½, $2.50; 10%
Silver Lake, Braided, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ⅌ gro..........25%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50.
Mason's Colored Cotton..........45%

Wire Clothes.. Nos. 18, 19, 20 — 100 ft. $3.50, $3.00, $2.50
Ventilator Cord, Samson Braided, White or Drab Cotton..⅌ doz $7.50, 20%

Links, Open.

Terry's—per gro.:

Nos.	1	2	3	4
	$6.00	8.00	12.00	16.00

Locks, &c.—

Cabinet—

Eagle, Gaylord Parker and Corbin... — List March, '84, rev Jan. 1, '85..33⅓&2%
Deitz, Nos. 36 to 39..........40%
Deitz, Nos. 51 to 63..........40&10%
Deitz, Nos. 86 to 96..........30%
Stoddard Lock Co..........50&33⅓%
"Champion" Night Latches..........40%
Barnes Mfg. Co..........40@40&10%
Eagle and Corbin Trunk..........25&2%
"Champion" Cab. and Combin...33⅓%
Yale..........net prices
Romer's..........25%

Door Locks, Latches, &c.

R. & E. Mfg. Co., list Mar. 20, 1889 / Mallory, Wheeler & Co., list July, '88 / Sargent & Co., list Aug. 1, '88 / Reading Hardware Co., list Feb. 2, '88 / Branford Lock Works — 65&10@70% Much lower net prices often made.
Brittan, Graham & Mathes, list Jan. 1890..........60&10&10%
Perkins' Burglar Proof..........60&25%
Plate..........33⅓&2%
Barnes Mfg. Co..........40@40&10%
Yale..........net prices
Deitz Flat Key..........20%
L. & C. Round Key Latches..........30&10%
L. & C. Flat Key Latches..........33⅓&10%
Romer's Night Latches..........15%
Brooklyn Latches..........50&10%
Shepardson or U. S..........35%
Seed's N. Y. Hasp Lock..........25%

Padlocks—

List June 10, 1891..........50&2%
Norwich Lock Mfg. Co., old list...70&2%
Yale Lock Mfg. Co.'s..........net prices
Eagle..........25&2%
Eureka, Eagle Lock Co..........40&2%
Romer's, Nos. 0 to 91..........30%
Romer's Scandinavian, &c., Nos. 100 to 505..15%
A. E. Deitz..........40%
Champion Padlocks..........40%
Hotchkiss..........30%
Star..........60%
Horseshoe..........⅌ doz, $9, 40@40&10%
Barnes Mfg. Co..........40@40&10%
Nock's..........30%
Brown's Pat..........25%
Scandinavian..........90@90&10%
E. T. Fraim's Keystone Scandavian. Nos. 119, 120, 130 and 140..........90&10%
Other Nos..........65%
Ames Sword Co. up to No. 150..........40%
Ames Sword Co. above No. 150..........50%
Slaymaker Barry & Co.
No. 1010 line..........35&5%
No. 41 line..........45&10%
No. 61 line..........50&5%
No. 21 line..........75%

Sash, &c.

Clark's, No. 1, $10; No. 2, $8 ⅌ gr...33⅓%
Ferguson's..........33⅓%
Victor..........60&10&5%
Walker's..........10%
Attwell Mfg. Co..........25&33⅓%
Reading..........66⅔&10@66⅔&10&10%
Hammond's Window Springs..........40%
Common Sense, Jap'd, Cop'd and Br'sed..........⅌ gr $4.00
Common Sense, Nickel Plated ⅌ gr $10.00
Universal..........30%
Kempshall's Gravity..........60%
Kempshall's Model..........60@60&10%
Corbin's Daisy, list Feb. 15, 1886.....70%
Payson's Perfect..........60&10%
Hugunin's Sash Balances..........25&5&5%
Hugunin's New Sash Locks..........25&5&5%
Stoddard "Practical"..........10%
Ives' Patent..........60&10@60&10&5%
Fish (Liesche's pat.), No. 100, ⅌ gr., $8; No. 105, ⅌ gr., $10..........40%
Davis, Bronze, Barnes Mfg. Co..........50%
Champion Safety, list January, 1889..70%
Security..........70%
Giant, list Jan., 1892..........70&5%

Lumber Tools—See Tools, Lumber.

Lustre—

Four-ounce Bottles....⅌ doz, $1.75; ⅌ gross..........$17 00

Machines.

Boring—

Without Augers.	Upright.	Angular.	
Douglas	$5.50	$6.75	50%
Snell's, Rice's Pat.	5.50	6.75	40&10&10%
Jennings	5.50	6.75	45@45&10%
Other Machines	2.35	2.75	
Phillips' Patent with Augers	7.00	7.50	
Miller's Falls	7.50		25%

Fluting.

Knox, 4½-inch Rolls.....$3.25 each / Knox, 6-inch Rolls.....$3.60 each — 35%
Eagle, 3½-inch Roll, $2.15..........35%
Eagle, 5½-inch Roll, $2.85..........35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6.50 each..........35%
Crown Jewel 6 in..........$3.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each..........35%
Domestic Fluter..........each, $1.50
Geneva Hand Fluter, White Metal ⅌ doz $12, 35%
Crown Hand Fluter, Nos. 1, $15.00; 2, $12.50; 3, $10.00..........30%
Shepard Hand Fluter, No. 85 ⅌ doz 15 30..........40%
Shepard Hand Fluter, No. 110 ⅌ doz $11.00..........40%
Shepard Hand Fluter, No. 95 ⅌ doz $8.00..........40%
Clark's Hand Fluter, ⅌ doz $15.00.....35%
Combined Fluter and Sad Iron, ⅌ doz $15.00.....30%
Buffalo ⅌ doz $10.00.....10%

Hoisting—

Moore's Hand Hoist, with Lock Brake..........30%
Moore's Differential Pulley Block....40%
Energy Mfg. Co's..........25%
Sure Grip Steel Tackle Blocks..........35%

Washing—

Anthony Wayne, ⅌ doz No. 1, $51 No. 2, $45; No. 3, $42.
Western Star ⅌ doz No. 2, $45; No. 3, $48.
Weisel..........⅌ doz $54 00
Fair and Square..........⅌ doz $42.00

Mallets.
Hickory.....20&10@20&10@10%
Lignumvitæ.....20&10@20&10@10%
S. & L. Block Co., Hickory & L. V. 20@30&10%

Mattocks. Regular list. 60&10@60&10@25%

Measures—
Standard Fiberware, No. 1, peck, ₩ dozen, $4; ½-peck, $3.60.

Meat Cutters—See Cutters, Meat.

Menders, Harness—
Per doz.....$2.00

Mills.
Coffee—
Box and Side, List Jan. 1, 1888, 60@60&10%
Net prices are often made which are lower than above discount.
American, Enterprise Mfg. Co. 20&10@30%
The Swift, Lane Bros.....20&10%

Mincing Knives—See Knives, Mincing.

Molasses Gates—See Gates, Molasses.

Money Drawers—See Drawers, Money.

Mowers, Lawn.
Pennsylvania, Philadelphia, New Model, Excelsior, Continental, &c.... 60&10%
Other Machines.....60&10&10@75%

Muzzles—
Safety.....₩ doz, $3.00, 25%

Nails.
Cut and Wire. *See Trade Report.*
Wire Nails, Papered.
Association list, July 15, '89, 75&10@80%
Tack Mfrs.' list.....70@70&10%
Wire Nails, Standard Penny.
Card June 1 '89 base.....$1.95 @ $2.00

Horse—

	Nos. 6	7	8	9	10	
American	8¾	8¾	8¾	8¾	8¾	net
Aussois	28	26	25	24	23	40&5&5%
Clinton, Fin.	19	17	16	15	14	30&10%
Essex	28	26	25	24	23	40&10&5&2%
Lyra	19	17	16	15	14	40&5%
Snowden	19	17	16	15	14	40&5%
Putnam	23	21	20	19	18	25%
Vulcan	23	21	20	19	18	25%
Northwest'n	25	23	22	21	20	25@25&5%
A. C	25	23	22	21	21	25&10@33½&2½%
C. B.-K	25	23	22	21	21	25&10@33½&2½%
Maud S	25	23	22	21	21	40&10&5%
Champlain	28	26	25	24	23	40&5&5&2%
Saranac	23	21	20	19	18	40&5%
Champion	25	23	22	21	20	10&10&10%
Capewell	19	18	17	16	16	10%
Anchor	23	21	20	19	18	35%
Western	23	21	20	19	18	50%
Empire Bronzed						14 ₩ ₺, net.

Picture—
Brass Head, Sargent's list.....50&10&10%
Brass Head, Combination list.....50&10%
Porcelain Head, Sargent's list.50&10&10%
Porcelain Head, Combination list..40&10%
Niles' Patent.....40%

Nail Pullers.—See Pullers, Nail.

Nail Sets.—See Sets, Nail.

Nut Crackers.—See Crackers, Nut.

Nuts—List Dec. 18, 1889.

	Square.	Hex.
Hot Pressed	5.35¢	5.95¢ off list.
Cold Punched	5.00¢	5.10¢ off list.

In packages of 100 ₺, add 1-10¢ ₩ ₺, net; in packages less than 100 ₺, add ½¢ ₩ ₺, net.

Oakum—
Best or Government.....₩ ₺ 7@7½¢
U. S. Navy.....₩ ₺ 6@6½¢
Navy.....₩ ₺ 5½@6¢

Oilers.
Zinc and Tin.....65&10@70&5%
Brass and Copper.....50&10&10&10&5%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₩ doz. 10@10&5%
Malleable, Hammers, Old Pattern, same list.....40%
Prior's Pat. or "Paragon" Zinc. 60&10&10%
Prior's Pat. or "Paragon" Brass.....50%
Olmstead's Tin and Zinc.....60%
Olmstead's Brass and Copper.....50%
Broughton's Zinc.....60%
Broughton's Brass.....50%
Gem P. D. & Co.....₩ gro. $2
Steel, Draper and Williams.....50%

Openers, Can.
Messenger's Comet.....₩ doz $3.00, 25%
American.....₩ gross $2.75@$3.00
Duplex.....doz 25¢, 15@20%
Lyman's.....₩ doz $3.75, 20%
No. 4 French.....₩ doz $2.25, 55@60%
No. 5, Iron Handle.....₩ gr $6.00, 45@50%
Eureka.....₩ doz $2.50, 10%
Sardine Scissors.....₩ doz $2.75@3.00
Star.....₩ doz $2.75
Sprague, No. 1, $2.00 2, $2.25; 3, $2.50; 50&10&10%
Excelsior No. 1 $2.50; No. 2, $1.50.....40%
World's Best, ₩ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $36.00.....50&10%
Universal, ₩ doz $3.00.....25&5%
Domestic, ₩ doz $2.50.....45%
Champion ₩ doz $2.00.....50%

Packing, Steam—
Rubber—
Standard.....70@70&10%
Extra.....60@60&5%
N. Y. B. & P. Co., Standard.....50%
N. Y. B. & P. Co., Empire.....60%
N. Y. B. & P. Co., Salamander.....25%
Jenkins' Standard. ₩ ₺ 80¢.....25@25&5%

Miscellaneous—
American Packing.....10¢@11¢ ₩ ₺
Russia Packing.....14¢ ₩ ₺
Italian Packing.....13¢@14¢ ₩ ₺
Cotton Packing.....15¢@17¢ ₩ ₺
Jute.....7¢@8¢

Pails.
Galvanized Iron—

Quarts	10	12	14
Hill's Light Weight, ₩ doz.	$2.75	3.00	3.25
Hill's Heavy Weight, ₩ dz.	3.00	3.25	3.75
Helwig's	2.50	2.75	3.00
Sidney Shepard & Co.	2.85	2.85	3.05
Iron Clad	2.50	2.75	3.00
Fire Buckets	2.75	3.25	3.50

Buckets, see Well Buckets.

Indurated Fibre Ware—25%
Star Pails, 12 qt.....₩ doz $5.40
Stable and Milk, 14 qt.....₩ doz $6.00
Fire Pails, deep.....₩ doz $5.40
" round bottom.....₩ doz $7.80

Standard Fibre Ware—

	Plain.	Decr'd
Water Pails, 12 qt., per doz.	$4.00	$4.50
Dairy Pails, 14 qt., per doz.	4.50	5.00
Fire Pails, No. 1, 12 qt. per doz	4.50	
Fire Pails, No. 2, 14 qt. per doz	5.00	
Sugar Pails	6.00	6.50
Horse Pails	5.00	
Buggy Pails	4.00	
Slop Jars (bal. trap)	8.00	9.00
Chamber Pails, 14-qt	6.50	7.50

Pans.
Dripping.
Smalls ises.....₩ ₺ 6½¢
Large sizes.....₩ ₺ 5½¢
Silver & Co. (Covered).....40%

Fry—
Standard List:

No.	0	1	2	3	4
₩ doz.	$3.00	$3.75	$4.25	$4.75	$5.25
No.	5	6	7	8	
₩ doz.	$6.00	$7.00	$8.00	$9.00	

Polished, regular goods.....75&75&10%
Acme Fry Pans.....60&10%

Dust—
Steel Edge, No. 1.....₩ doz $1.75

Paper and Cloth—
Sand and Emery—
List April 19, 1886.....50@50&10%
Sibley's Emery and Crocus Cloth.....50%

Parers.
Apple.
Advance.....₩ doz $4.75
Baldwin.....₩ doz 5.25
Bonanza.....each 5.00
Daisy.....₩ doz 4.00
Dandy.....each 7.50
Eclipse.....₩ doz 4.25
Eureka, 1888.....each 16.00
Family Bay State.....₩ doz 12.00
Favorite.....₩ doz 5.00
Gold Medal.....₩ doz 4.00
Ideal.....₩ doz 4.00
Improved Bay State..₩ doz 27.00 @ 30.00
Little Star.....₩ doz 4.50
Monarch.....₩ doz 13.50
New Lightning.....₩ doz 5.50
Oriole.....₩ doz 4.00
Penn.....₩ doz 4.00
Perfection.....₩ doz 4.00
Pomona.....₩ doz 4.00
Rocking Table.....₩ doz 6.00
Turn Table.....₩ doz 4.50
Victor.....₩ doz 13.50
Waverly.....₩ doz 4.00
White Mountain.....₩ doz 4.00
[illegible].....₩ doz. 4.25
[illegible].....₩ doz. 7.00

Potato—
White Mountain.....₩ doz $4.50
Antrim Combination.....₩ doz $5.50
Hoosier.....₩ doz $13.50
Saratoga.....₩ doz $5.50

Pencils—
Faber's Carpenters'.....high list 50%
Faber's Round Gilt.....₩ gro $5.25
Dixon's Lead.....₩ gro $4.50
Dixon's Lumber.....₩ gro $6.75
Dixon's Carpenters'.....10%

Picks—
Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00.....60&10@60&10&5%

Picture Nails.—See Nails, Picture.

Pinking Irons.—See Irons, Pinking.

Pins.
Box—
Humason, Beckley & Co.'s.....60&10%
Sargent & Co's...$17 and $18.....60&10%
Peck, Stow & W Co...50&10@50&10&5%
Curtain—
Silvered Glass.....net
White Enamel.....net
Escutcheon,
Iron, list Nov. 11, 1885..50&10@50&10&5%
Brass.....60@60&5%

Pipe, Wrought Iron—
List September 18, 1889.
1¼ and under, Plain.....57½@60%
1¼ and under, Galvanized.....47½@50%
1¼ and over, Plain.....67½@70%
1¼ and over, Galvanized.....55@57½%
Boiler Tubes.
Sizes up to 2¾ in. inclusive.....55%
Sizes 3 in. and larger.....65%
Casing.....55%
Inserted Joints Casing.....50%
Steel Boiler Tubes.....30%

Planes and Plane Irons—
Wood Planes—
Molding.....40&10%
Bench, First Quality.....50&10%
Bench, Second Quality.....55&10%
Bailey's (Stanley R. & L. Co.).....50&10%
Iron Planes—
Bailey's (Stanley R. & L. Co.).....50&10%
Miscellaneous Planes (Stanley R. & L. Co.).....25&10%
Steer's Iron Planes.....35&35&10%
Meriden Mal. Iron Co.'s.....40@40&10%
Davis's Iron Planes.....40@40&10%
Birmingham Plane Co.....50@50&10%
Gage Tool Co.'s Self-Setting.....20&10&10%
Chaplin's Iron Planes.....40@40&10%
Sargent's.....30&10@30&10&10%
Standard Tool Co.....50@50&5%
Plane Irons—
Butcher's.....$5.00@$5.25 to £
Buck Bros.....30%
Auburn "Thistle."
Ohio.....30&10%
Sandusky.
S. & I. J. White.....25%
Stanley R. & L. Co.....50&10%

Plates.
Fallow.....₩ ₺ 5¢@5½¢

Pliers and Nippers.
Button's Patent.....50@50&10%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in., $21.00 ₩ doz.....40%
Humason & Beckley Mfg. Co..50@50&10%
Lindsay's Giant.....40%
Gas Pliers.....60%
Gas Pliers, Custar's Nickel Plated..60&5%
Eureka Pliers and Nippers.....40%
Russell's Parallel.....25%
P. S. & W. Cast Steel.....50%
P. S. & W. Tinners' Cutting Nippers, add 5% dis 10%
Carew's Pat. Wire Cutters.....30%
Morrill's Parallel, ₩ doz, $12.00...30&5%
Cronk's 8 in., $15.00; 10 in. $21.00, 5%@50&5%
Cronk's Button Pa'tern.....50&10@60%
Cronk's Carrier Pliers.....60@60&5%

Plumbs and Levels—
Regular List.....75&10@75&10&5%
Stanley's Duplex.....20&10%
Stanley's Handy.....20&10%
Disston's.....50%
Pocket Levels.....70&10@70&10&10%
Davis Iron Levels.....30%
Davis' Inclinometers.....10&10%

Poachers.
Egg.
Buffalo Steam Egg Poachers, ₩ doz, No. 1, $6.00; No. 2, $9.00.....25%
Silver & Co., 6-Ring..₩ doz $4; 8-Ring $2

Pokes, Animal—
Bishop's I. X. L.....₩ doz $6.00
Bishop's O. K.....₩ doz $5.25
Bishop's Pioneer.....₩ doz $3.75
Bishop's American.....₩ doz $2.75
Eagle, Double Stale.....₩ doz $5.75
Eagle, Single Stale.....₩ doz $3.75
Buckeye, Single Stale.....₩ doz $2.75

Police Goods.
R. I. Tool Co., Handcuffs, $15.00 ₩ doz 10%
R. I. Tool Co., Leg Irons, $35.00 ₩ doz 10%
Tower's.....25%
Daley's Improved Handcuffs: 2 Hands, Polished, ₩ doz $48.00; Nickeled, $57.00; 3 Hands, Polished, ₩ doz $72.00; Nickeled, $84.00.....25%
J. P. Lovell's Police Goods.....25%

Polish, Metal.
Prestoline.....30%
Prestotine Paste.....33⅓%
Gaston's Silver Compound.....33⅓%

Polish, Stove.
Joseph Dixon's.....₩ gro $6.00, 10%
Gem.....₩ gro $4.50, 10%
Gold Medal.....₩ gro $6.00, 25%
Mirror.....₩ pro $6.00, —%
Lustro.....₩ gro $4.75
Ruby.....₩ gro $3.75
Rising Sun, 5 gro lots.....₩ gro $5.50
Dixon's Plumbago.....₩ ₺ 8¢
Boynton's Noon Day, ₩ gro.....13.00
Parlor Pride Stove Enamel..₩ gro
Yates' Liquid. 2 3 5 10 gal.... ₩ gal .30 .30 .70 .80 .50
Yates Standard Paste Polish, 10-₺ cans, ₩ ₺ 12½¢
Jet Black.....₩ gro $3.50
Japanese.....₩ gro $3.50
Fireside.....₩ gro $2.50
Diamond O. K. Enamel.....₩ gro $19.00
Bonnell's Liquid Stove Polish..₩ gro $9.00
Bonnell's Paste Stove Polish..₩ gro $6.00
Black Eagle Bensine Paste, 5 and 10 ₺ cans.....12½¢
Black Jack Water Paste, 5 and 10 ₺ cans.....12½¢
Nickel Plate Paste.....₩ gro $6.00
Crown Paste.....₩ gross, $7.20
Crown Paste, in 5 and 10 ₺ pails ₩ ₺ 12¢
Black Flag.....₩ gross, $7.20
Black Flag, 5 and 10 ₺ pails,...₩ ₺ 12¢
Black Flag, liquid, in bottles, ₩ gro..$8.00
Diamond Rock Nickel Cleaner..₩ gro. $10.20

Peppers, Corn—
Round or Square, 1 qt..₩ gr $10.00@10.50
Round or Square, 1½ qt..₩ gr $15@15.50
Round or Square, 2 qt..₩ gr $18.50@19.00

Peat Hole and Tree Augers and Diggers—See Diggers, Post Hole, &c.

Potato Parers—See Parers, Potato.

Pots.
Glue—
Tinned.....40&10@40&10&5%
Enameled.....40&10@40&10&5%
Family, Howe's "Eureka".....40%
Family, L. F. C.'s "Handy".....50%

Presses.
Fruit and Jelly—
Enterprise Mfg. Co.....20&10@30%
Hemis.....₩ doz $3.50
Shepard's "Queen City".....40%
Silver & Co.....₩ doz $2.75

Pruning Hooks and Shears.—See Shears.

Pullers.
Nail.
Scranton.....₩ doz $18.00, 33⅓%
Curtiss Hammer.....₩ doz $9.00
Giant, No. 1.....₩ doz. $13.00, 10%
Giant, No. 2.....₩ doz, $15.00, 10%
Pelican.....₩ doz, $9.00, 25%
Eclipse.....each, $2.00 net

Pulleys—
Hot House, Awning, &c.....60&10%
Japanned Screw.....60&10%
Brass Screw.....60&10%
Japanned Side.....60%&10%
Japanned Clothes Line.....60&10%
Empire Sash Pulley.....55@60%
Moore's Sash, Anti-Friction.....50%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50.....50&10@50&10&5%
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70.....50%
Hay Fork, "P" Common and Pat. Bushed.....20%
Hay Fork, Tarbox Pat. Iron.....20%
Hay Fork, Reed's Self-Lubricating.....60%
Shade Rack.....45%
Tackle Blocks.....See Blocks
Moore's Anti-Friction 5 in. Wheel, ₩ doz $12.00.....40%

Pumps—
Cistern, Best Makers.....60@60&10%
Pitcher Spout, Best Makers.....67½@70%
Pitcher Spout, Cheaper G'ds..75@75&10%

Punches—
Saddlers' or Drive, good, ₩ doz...60@65%
Bemis & Call Co.'s Cast Steel Drive..50&5%
Bemis & Call Co's Springfield Socket.50&5%
Spring, good quality....₩ doz $2.50@2.60
Spring, Leach's Pat.....15%
Bemis & Call Co.'s Spring and Check..40%
Solid Tinners', P. S. & W. Co., ₩ doz $1.44, 50%
Tin'rs' Hollow Punches P. S. & W. Co. 30&3%
Rice Hand Punches.....15%
Avery's Revolving.....40%
Avery's Saw-Set and Punch. See Saw Sets.

Rail—
Sliding Door, Wr't Brass, ₩ ₺ 35¢.....15%
Sliding Door, Bronzed Wr't Iron..₩ ft. 7¢
Sliding Door, Iron, Painted, ₩ foot 4¢, 40%
Barn Door, Light, In. ½ ¾ 1
Per 100 feet.....$2.00 2.50 3.10, 10%
B. D. for N. E. Hangers—

	Small.	Med.	Large.
Per 100 net	$2.15	2.70	3.25 net

Terry's Steel Rail, ₩ foot.....3½¢
Victor Track Rail, 7¢ ₩ foot.....50&5%
Carrier, double braced, Steel Rail, ₩ foot.....4@4½¢
Moore's Wrought Iron.....30%

Rakes—
Cast Steel, Association goods...65%@70%
Cast Steel, outside goods 60&10&10@70&5%
Malleable.....70%@70&5%
Gibbs Lawn Rake.....₩ doz $4.90
Canton Lawn Rake.....₩ doz $3.75
Favorite Lawn Rake.....₩ doz $4.40
Ft. Madison Prize Bow Brace and Peerless.....30%
Fort Madison Steel Tooth Lawn Rake, $6.00.....30%

Razors—
J. R. Torrey Razor Co.....30%
Wostenholme and Butcher, $10 to $.....10%
Jordan's AAAI, new list.....net
Jordan's Old Faithful, new list.....net
Galvanic.....₩ doz $15.00

Razor Strops—See Strops, Razor.

Rings and Ringers.
Bull Rings—
Union Nut Co.....55%
Sargent's.....60%&10@70&5%
Hotchkiss' low list.....30%
Humason, Beckley & Co.'s.....70&10%
Peck, Stow & W. Co's..50&10@50&10&10%
Ellrich Hdw. Co., White Metal, low list. 50@50&10%
Hog—
Top of the Hill Ringers.....₩ doz $2.00
Top of the Hill Rings.....₩ doz $1.25
Hill's Improved Ringers.....₩ doz $1.25
Hill's Old Style Ringers.....₩ doz $1.13½
Hill's Tones.....₩ doz $2.00
Hill's Rings.....₩ doz bxs $1.00
Perfect Rings.....₩ doz bxs $1.50
Perfect Ringers.....₩ doz $2.15@2.25
Blair's Hog Ringers.....₩ doz $2.00
Blair's Hog Rings.....₩ doz 90¢@$1.00
Champion Ringers.....₩ doz $2.00
Champion Rings, Double.....₩ doz $2.25
Brown's Ringers.....₩ doz $2.00
Brown's Rings.....₩ doz $1.15@1.25
Electric Hog Rings....₩ doz boxes $1.50
Electric Hog Ringers.....₩ doz $2.00
Major Rings.....₩ doz $1.25
Major Ringers.....₩ doz $2.00

Rivets and Burrs—
Iron, list Nov. 17, '87.....40%
Copper.....60&10%
Coppered Iron, Bettins Brand.....40%

Rivet Sets—See Sets.

Rods—
Stair, Brass.....25&2½
Stair, Black Walnut.....₩ doz 40¢

Rollers—
Barn Door, Sargent's list.....60&10&10%
Acme Moore's Anti-Friction.....55%
Union Barn Door Roller.....70%

Rope.
Manila, 7-16 in. diam. and larger ₩ ₺ 13¼¢
Manila.....⅜ in. ₩ ₺ 12¾¢
Manila.....¼ and 5-16 in. ₩ ₺ 12¼¢
Manila Tarred Rope.....₩ ₺ 11¾¢
Manila, Hay Rope.....₩ ₺ 12¼¢
Sisal.....7-16 inch and larger ₩ ₺ 10¾¢
Sisal.....⅜ in. ₩ ₺ 10¾¢
Sisal.....¼ and 5-16 in. ₩ ₺ 11¾¢
Sisal, Hay Rope.....₩ ₺ 10¾¢
Sisal, Tarred Rope.....₩ ₺ 9¾¢
Sisal, Medium Lath Yarn.....₩ ₺ 9¾¢
New Zealand..7-16 in. & larger ₩ ₺ 8¾¢
New Zealand.....⅜ inch, ₩ ₺ 9¼¢
New Zealand, ¼ and 5-16 inch, ₩ ₺ 9¾¢
New Zealand, Hay Rope.....₩ ₺ 8¾¢
New Zealand, Tarred Rope.....₩ ₺ 8¾¢
Note.—Manufacturers' prices on above 1¢ ₩ ₺ less, f.o.b. factory—less 1½% for cash.
Cotton Rope.....₩ ₺ 13½@16¢
Jute Rope.....₩ ₺ 6½@7¢
Wire—
List February, 1892.
All kinds.....45%

Rules—
Boxwood.....30&10&10%
Ivory.....50@50&10%
Starrett's Rules and Straight Edges, Steel.....35&10%

Sad Irons—See Irons, Sad.
Sand and Emery Paper and Cloth—See Paper and Cloth, Sand and Emery.
Sash Cord—See Cord, Sash.
Sash Locks—See Locks, Sash.
Sash Weights—See Weights, Sash.
Sausage Stuffers or Fillers—See Stuffers or Fillers, Sausage.
Saws—The following prices are often cut by jobbers.
Disston's Circular.....45@45&5%
Disston's Cross Cuts.....45@45&5%
Disston's Hand.....30@20&5%
Woodrough & McFarlin.
Hand, Panel and Rip.....25@25&5%
Narrow Champion Cross Cuts with Handles, ₩ foot.....18@20¢
Champion Thin Back Cross Cuts, ₩ foot.....20@22¢
Champion Extra Thin Back Cross Cuts, ₩ foot.....29@31¢
One Man Champion Cross Cuts, ₩ foot.....37@40
Wheeler, Madden & Clemson Mfg. Co.
Hand, Panel and Rip.....3@3&5%
Narrow Champion Cross Cuts with Handles, ₩ foot.....18@20¢
Champion Thin Back Cross Cuts, ₩ foot.....20@22¢
Champion Extra Thin Back Cross Cuts, ₩ foot.....29@31¢
One Man Champion Cross Cuts, ₩ ft..37@40
Atkins' Circular Shingle & Heading..50%
Atkins' Silver Steel Diamond X Cuts ₩ foot 70¢
Atkins' Special Steel Dexter X Cuts ₩ foot 50¢
Atkins' Special Steel Diamond X Cuts ₩ foot 32¢
Atkins' Champion and Electric Tooth X Cuts.....₩ foot 30¢
Atkins' Hollow Back X Cuts..₩ foot 20¢
Atkins' Mulay, Mill and Drag.....40%
Atkins' One-Man Saw, with handles, ₩ foot 40¢
Peace Circular and Mill.....45@45&5%
Peace Hand Panel and Rip.....25@25&5%
Peace Cross Cuts.....45@45&5%
Richardson's Circular and Mill.45@45&5%
Richardson's X Cuts.....45@45&5%
Richardson's Hand, &c.....25@25&5%
C. E. Jennings & Co., Hand, Panel and Rip.....25@25&10%

Hack Saws—

Griffin's, complete.....40&10@50%
Griffin's Hack Saw, Blades....40&10@50%
Star Hack Saws and Blades.....20%
Eureka and Crescent.....35%

Scroll—

Lester, complete, $10.00.....25%
Rogers, complete, $4.00.....25%
Barnes' Builders' and Cab. Makers' $15.25%
Barnes' Scroll Saw Blades.....35%

Saw Frames—See Frames, Saw.

Saw Sets—See Sets, Saw.

Saw Tools—See Tools, Saw.

Scales—

Hatch, Counter, No. 171, good quality, ₩ doz $21.00
Hatch, Tea, No. 161....₩ doz $6.75@$7.00
Union Platform, Plain.....$2.10@2.20
Union Platform, Striped.....$2.40@2.50
Chatillon's Grocers' Trip Scales 50%
Chatillon's Eureka.....25%
Chatillon's Favorite.....40%
Family, Turnbulls.....30@30&10%
Richie Bros.' Platform..... .....40%

Scale Beams—See Beams, Scale.

Scissors, Fluting.....45%

Scrapers—

Adjustable Box Scraper (S. R. & L. Co.) $5.50.....20&10%
Box, 1 Handle.....₩ doz $4.00. 10%
Box, 2 Handle.....₩ doz $6.00. 10%
Defiance Box and Ship.....20&10%
Foot.....50&10@60%
Ship, Common .....₩ doz $3.50 net
Whip, R. I. Tool Co.....10%

Screen Window and Door Frames—See Frames.

Screw Drivers—See Drivers, Screw.

Screws.

Bench and Hand—

Bench, Iron.....55&10@55&10&10%
Bench, Wood, Beech.....₩ dos $2.25
Bench, Wood, Hickory.....20&10%
Hand, Wood.....25&10@25&10&5%
Hand, Grand Rapids, list.....75%
Lag, Blunt Point, list Jan. 1, 1890.75&10%
Coach and Lag, Gimlet Point, list Jan. 1, 1890.....75@75&10%
Bed.....25&5%
Hand Rail, Sargent's.....60%&10%
Hand Rail, H. & F. Mfg. Co...70&10@75%
Hand Rail, Am. Screw Co.....75%
Jack Screws, Millers Falls list..50@50&5%
Jack Screws, P. S. & W.....35%
Jack Screws, Sargent...60&10@60&10&5%
Jack Screws Stearns'.....40@40&10%

Cork—

Humason & Beckley Mfg. Co..40&10@50%
Williamson's.....33⅓@33⅓&2½%
Howe Bros & Hulbert.. .....35%

Machine—

Flat Head, Iron..... .....55%
Round Head, Iron 50%

Wood—

List January 1, 1891.

Flat Head Iron	70	Extra 10 & 10&5 % discount given.
Round Head Iron	65	
Flat Head Brass	70	
Round Head Brass	65	
Flat Head Bronze	70	
Round Head Bronze	65	
Rogers' Drive Screws	82½&5	

Scroll Saws—See Saws, Scroll.

Scythes.

Grain.....40&5@40&10%
Grass..... ....40&10@50%

Scythe Snaths—See Snaths, Scythe

Sets.

Awl and Tool.

Aiken's Sets, Awls and Tools, No. 20, ₩ doz $10.00.....55&10%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9.....25@25&10%
Miller's Falls Adj. Tool Hdls.. Nos. 1, $12, 2, $18.....25%
Henry's Combination Rafl...₩ doz $6.50
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50.....50&10%
Common Brad Sets, No. 42, $10.50; No. 43, $12.50..70&10&5%

Nail—

Square.....₩ gr., $4 00@$4.25
Round.....₩ gr. $3.25
Back Bros.....27½%
Cannon's Diamond Point..₩ gr.,$12, 20%

Rivet,

Regular list.....50&10%

Saw—

Stillman's Genuine...₩ doz $5.00@7.75, 40&5%
Stillman's Pattern, Hand, ₩ doz $3.25; Cross Cut, 5.25.....45@50%
Common Lever .....₩ doz $2.00, 45@50%
Morrill's No. 1, $15.00; Nos. 3&4, $24.00. 40&10@50%
Leach's. .No. 0, $8.00; No. 1, $15, 15@20%
Nash's .....20&10@20&10&10
Hammer, Hotchkiss.....$5.50, 10%
Hammer, Bemis & Call Co.'s new Pat. 30&5%
Bemis & Call Co.'s Lever and Spring Hammer.....30&5%
Bemis & Call Co.'s Plate.....10%
Bemis & Call Co.'s Cross Cut 12½%
Aiken's Genuine.....$13.00, 50&10@60%
Aiken's Imitation.....$7.00, 55&5%
Hart's Pat. Lever.....20%
Disston's Star. 25%
Leopold.....40&10@50%
Atkin's Lever... .....₩ dos No. 1, $6.00
Atkin's Criterion.....₩ dos No. 1, $6.00
Crossant (Keller), No. 1, $15.00; No. 2, $24.00.....40&10%
Avery's Saw Set and Punch.....50%
Chieftain Co.'s Superior.....₩ dos $7.00
Chieftain Co.'s Royal.....₩ dos $7.50
Crescent..... .....₩ dos $8.00
Lloyd's Acme.....₩ doz $15.00, 40&10%

Sharpeners, Knife.

Parkins.

Applewood Handles....₩ dos $6.00, 40%
Rosewood or Cocobo a. ₩ dos $900 40%

Shaves, Spoke

Iron.....45%
Wood.....30%
Bailey's (Stanley R. & L. Co.).....40&10%
Stearns'.....30&10%
Cincinnati.....25&10%
Goodell's, ₩ dos $9.00.....25%

Shears—

American (Cast) Iron...75&10@75&10&5%
Barnard's Lamp Trimmers...₩ dos $5.75
Tinners'.....60&2%
Seymour's, List, Dec., 1881. 60&10&10@60&10&10&5%
Heinisch's, List, Dec., 1881. 60&10&10@60&10&10&5%
Heinisch's Tailor's Shears.....33⅓%
Cast Steel Trimmers: First quality.....80@80&10%
Second quality.....80&10@80&10&10%
Acme Cast Shears.....10&10%
Diamond Cast Shears.....10%
Clipper.....10&10%
Victor Cast Shears.....75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel.....40%
Chicago Drop Forge & F. Co., Solid Steel Forged.....60%
Davenport Cutlery Co.....60@60&10%
Clauss Shear Co., Japanned 70%
Clauss Shear Co., Nickeled, same list.60%
Galvanic, 3½ to 9 in, ₩ doz, $1.00 ₩ inch

Pruning Shears and Hooks.

Disston's Combined Pruning Hook and Saw.....₩ doz $18.00, 20&10%
Disston's Pruning Hook, ₩ dos $12.00, 20&10%
E. S. Lee & Co.'s Pruning Tools.....40%
Pruning Shears, Henry's Pat, ₩ dos $3.75@4.00
Henry's Pruning Shears, ₩ dos $4.25@4.50
Wheeler, M. & C. Co.'s Combination, ₩ doz $12.00, 20%
Dunlap's Saw and Chisel, ₩ doz $8.50, 30%
J. Mallinson & Co., No. 1, $5.35; No. 2 7.25
P., S. & W. Co.....60%

Tinners', &c.—

Shears and Snips (P. S. & W.).....20@25%
Snips, J. Mallinson & Co.....33⅓%

Sheaves—

Sliding Door—

M. W. Co., list July, 1888..50&10@60&5%
R. & E., list Dec. 18, 1885.....55&20%
Corbin's list.....60&10&2%
Patent Roller.....60&10&2%
Patent Roller, Hatfield's.....75%
Russell's Anti-Friction, list Dec. 18, 1885.....60&2%
Moore's Anti-Friction.....50%

Sliding Shutter—

R. & E. list Dec. 18, 1885 .....60&10&2%
Sargent's list.....60&10%
Reading list .....60&10&10%

Shells—

First quality 4, 8, 10 and 12 gauge 25&10&2%
First quality, 14, 16 and 20 gauge ($10 list).....30&10&2%
Prize.....40&2%
Star, Club, Rival and Climax brands. 33⅓&10&2%
Selbold's Comb. Shot Shells.....15&2%
Brass Shot Shells, 1st quality.....60&2%
Brass Shot Shells, Club, Rival, Climax.. 65&2%

Shells Loaded—

Standard List, July 19, 1890..... 40&10&10@40&10&10&5%

Ship Tools—

L. & I. J. White.....20&5%

Shoes, Horse, Mule, &c.—

Horse—

Burden's, Perkins', Phœnix and Bryden's Boss, at factory. $4.00
Bryden's Frog Pressure, at factory.$5.00

Mule—

Add $1 ₩ keg to above prices.

Ox, Wrought—

Ton lots.....₩ ℔ 9¢
1000 ℔ lots.....₩ ℔ 9½¢
500 ℔ lots.....₩ ℔ 10¢

Shot—

	Ton lots	Small lots
Drop, up to B, 25-℔ bag...$1.25		$1.30
Drop, up to B, 5-℔ bag...	.35	.35
Drop, B and larger, 25-₩ bag	1.50	1.55
Drop, B and larger 5-℔ bag.....	.40	.40
Buck and Chilled, 25-℔ bag.....	1.50	1.55
Buck and Chilled, 5-℔ bag.....	.40	.40
Dust Shot, 25-℔ bag.....	1.95	2.00
Dust Shot, 5-℔ bag.....	.45	.45

Shovels and Spades—

Ames' Shovels, Spades, &c., list Nov. 1, 1885.....20%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron.....50&10%
Griffith's C. S.....60@60&10%
Griffith's Solid C. S. R. R. Goods.....20%
St. Louis Shovel Co.....20@20&7½%
Hussey, Binns & Co.....15@25%
Hubbard & Co.....20@20&7½%
Lehigh Mfg. Co.....50&10%
H. M. Myers Co.....30%
Payne Pettebone & Son.....33⅓&5%
Remington's (Lowman's Pat.)30&10@40%
Rowland's, Black Iron.....50&10%
Rowland's Steel.....60&5@60&10%

Shovels and Tongs—

Iron Head.....60&10@60&10&5%
Brass Head.....60&10&10%

Sieves—

Mann's Tin Rim.....50&25%
Buffalo Metallic, S. S. & Co.....50&25%
Shaker (Barler's Pat.) Flour Sifters.... ₩ dos $2.00; ₩ gr $21.60
Electric.....₩ gr $21.00
A. & W. Sifters.....₩ dos 2.00
Hunter's.....₩ dos $2.00

Sieves, Wooden Rim—

	Iron.	Plated
Mesh 18, Nested, ₩ dos..	80¢	$1.00
Mesh 20, Nested, ₩ dos..	95¢	1.10
Mesh 24, Nested, ₩ dos..	$1.15	1.25

Skeins, Thimble—

Western list.....75&5&75&10%
Columbus Wrt. Steel. Special net prices
Coldbrookdale Iron Co.....60%
Seneca Falls Pattern.....60%
Utica P. S. T. Skeins.....60%
Utica Turned and Fitted.....35%

Slates—

School, by case.....50&10@50&10&10%

Snaps, Harness, &c.—

Anchor (T. & S. Mfg. Co.).....65%
Fitch's (Bristol).....50&10%
Hotchkiss.....10%
Andrews.....50%
Sargent's Patent Guarded.....70&10&10%
German, new list..... .....40&10%
Covert.....50&10&5&2%
Covert, New Patent.....50&10&5&2%
Covert, New R. E.....60&10&5&2%
Covered Spring.....60&10&10%
E. Covert's Triumph.....33⅓%

Snaths, Scythe.

List.....50%

Soldering Irons—See Irons, Soldering.

Spittoons, Cuspidors, &c.

Standard Fiberware—

Cuspidors, 8¼-inch, ₩ dos., No. 5, $8; No. 5X $9.
Spittoons, Daisy, 8-inch, No. 1, $4; 10 and 11 inch, $6.

Spoke Shaves—See Shaves, Spoke.

Spoke Trimmers—See Trimmers, Spoke.

Spoons and Forks—

Tinned Iron—

Basting, Cen. Stamp. Co.'s list....70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list.....70&10%
Buffalo S. S. & Co... .....33⅓&2%

Silver-Plated—(4 mos. or 5% cash 30 days).

Meriden Brit. Co., Rogers.....40&15%
C. Rogers & Bros.....40&15%
Rogers & Bro.....40&15%
Reed & Barton.....40@40&5%
Wm. Rogers Mfg. Co.....40, 15&5%
Simpson, Hall, Miller & Co.....40, 15&5%
Holmes & Edwards Silver Co...40, 15&5%
L. Boardman & Son..... .....50&12½%

Miscellaneous.

Holmes & Edwards Silver Co.:
No. 67 Mexican Silver.....50&10&5%
No. 90 Silver Metal.....50&10&5%
No. 24 German Silver.....50&10&5%
No. 50 Nickel Silver.....50&5%
No. 49 Nickel Silver.....50&10&5%
Wm. Rogers Mfg. Co.
Rogers' Silver Metal.....50, 10&5%
18% Rogers' German Silver.....60&5%
25% Rogers' Nickel Silver.....50&5%
German Silver.....50@50&5
German Silver, Hall & Elton..50&5% cash
Nickel Silver.....50&5@50&10&5% cash
Britannia.....60@60&5%
Boardman's N'ck'l Silver, list July 1, 1891.....60&7½&5%
Boardman's Britannia Spoons, case lots.....60&5% cash

Springs—

Door.—

Torrey's Rod, 39 in.....₩ dos $1.20@1.25
Gray's, ₩ gr., $20.00..... .....25%
Bee Rod ₩ gr., $20.00..... .....20@25%
Warner's No. 1, ₩ dos, $2.50; No. 2, $3.50.....50@50&5%
Gem (Coil), list April 19, 1886.....10@15%
Star (Coil), list April 19, 1886...20@20&5%
Victor (Coil).....60&10@60&10&5%
Champion (Coil).....60&10@60&10&10%
Cowell's....No. 1, ₩ dos, $18.00; No. 2, $15.00.....50@50&10%
Rubber, complete, ₩ dos, $4.50...55&10%
Hercules.....50@50&10%

Carriage, Wagon, &c.—

Elliptic, Concord, Platform and Half Scroll.....60&10&10%
Cliff's Bolster Springs.....25%

Squares—

Steel and Iron..... } .80&10@80&10&10%
Nickel-Plated..... }
Try Square and T Bevels...60&10@60&10&10%
Disston's Try Square and T Bevels.....50%
Winterbottom's Try and Miter.....30&10%
Starrett's Micrometer Caliper Squares. 25%
Avery's Flush Bevel Squares.....40%
Avery's Bevel Protractor 50%

Squeezers.

Fodder.—

Blair's..... .....₩ dos $2.00
Blair's "Climax"..... .....₩ dos $1.25

Lemon—

Porcelain Lined, No. 1....₩ dos $6.00. .....25&20%
Wood, No. 2.....₩ dos $3.00, 35%
Wood, Common.....₩ dos $1.70@1.75
Dunlap's Improved .....₩ dos $3.75, 20%
Sammis....No. 1, $5.00; No. 2, $9; 12, $18 ₩ dos.....25&10%
Jennings' Star.....₩ dos $2.50
The Boss.....₩ dos $2.50
Dean's..Nos. 1, ₩ dos $6.50; 2, $3.35; 3, $1.90; Queen, $2.50
Little Giant.....60@50&5%
King.....40&5%
Hotchkiss Straight Flash....₩ doz $12.00
Silver & Co., Glass.....₩ gro. $9.00
Manny Lemon Juice Extractor: Standard.....₩ dos $0.75@$1.00 Improved.....₩ dos $2.00

Standard Fiber Ware—See Ware, Standard Fiber.

Staples.

Blind—

Barbed, ½ in. and larger.....₩ ℔ 7@7½¢
Barbed, ¼ in. ....₩ ℔ 8@8½¢
Fence staples, Galvanized. } Same price as B'rb Wire.
Fence Staples, Plain..... } See Trd. Rep.

Steelyards... .....40&10@50%

Stocks and Dies—

Blacksmith's
Waterford Goods.....33⅓&40
Butterfield's Goods.....33⅓&40
Lightning Screw Plate.....25&20%
Reece's New Screw Plates....33⅓&5&40%
Reversible Ratchet..... 30
Gardner.....25%

Stops, Bench.

Morrill's..... ₩ dos $9.50
Hotchkiss's.....₩ dos $5. 10&10&10%
Weston's, No. 1, $10; No. 2, $9.25&10&2%
McGill's.....₩ dos $3.....10%
Cincinnati.....25&10%
Terrell's Nos. 1 and 2, ₩ dos., $3; No. 3, $3.60.....30%

Stone—

Hindostan No. 1, 3¢; Axe, 3½¢; Slips No. 1, 4½¢
Sand Stone.....₩ ℔ 2½¢
Washita Stone, Extra.....₩ ℔ 23@23¢
Washita Stone, No. 1.....₩ ℔ 19@20¢
Washita Stone, No. 2.....₩ ℔ 12@13¢
Washita Slips, No. 1, Extra..₩ ℔ 44@46¢
Washita Slips, No. 1.....₩ ℔ 32@35¢
Arkansas Stone, No. 1, 4 to 6 in₩ ℔ $1.50
Arkansas Stone, No. 1, 6 to 9 in₩ ℔ $1.85
Turkey Oil Stone, 4 to 8 in.....₩ ℔ 40¢
Turkey Slips.....₩ ℔ $1.00@1.50
Lake Superior, Chase..... .....₩ ℔ 18¢
Lake Superior Slips, Chase.....₩ ℔ 20¢
Seneca Stone, Red Paper Brand....₩ ℔ 18@20¢
Seneca Stone, High Rounds..₩ ℔ 30@35¢
Seneca Stone, Small Wheels..₩ gro $36.00

Stove Polish—See Polish, Stove.

Stretchers, Carpet.

Cast Steel, Polished.....₩ dos $2.25
Cast Iron, Steel Points.....₩ dos 80¢
Socket.....₩ dos $1.75
Gullard's.....25@25&10%

Strops, Razor—

Genuine Emerson.....60@60&5%
Imitation " .....₩ doz $2.00, 20&10&5%
Torrey's.....20%
Badger's Belt and Com.....₩ dos $8.00
Lamont Combination.....₩ dos $4.00
Jordan's Pat. Padded, list Nov. 1, '89.50%
Electric.....List net

Stuffers or Fillers, Sausage—

Miles' "Challenge," ₩ dos $20, 50&50&5%
Ferry .....₩ dos, No. 1, $15.00; No. 0, $21.00.....50&5@50&10%
Draw Cut No. 4, each $30.00.....20%
Enterprise Mfg. Co.....20&10@20%
Silver's.....40&10%

Sweepers, Carpet.

Bissell No. 5.....₩ dos $17.00
Bissell No. 8.....₩ dos $20.00
Bissell, Grand.....₩ dos $36.00
Standard.....₩ dos $24.00
Domestic .....₩ dos $21.00
Domestic, No. 2.....₩ doz $22.00
Grand Rapids.....₩ dos $36.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic.....₩ dos $15.00
Improved Parlor Queen, Nickeled..₩ dos $27.00
Japanned.....₩ dos $24.00
Excelsior .....₩ dos $22.00
Garland .....₩ dos $18.00
Parlor Queen.....₩ dos $36.00
Housewife's Delight.....₩ dos $15.00
Queen.....₩ dos $16.00
Queen, with band.....₩ dos $18.00
King .....₩ dos $30.00
Weed, Improved.....₩ dos $18.00
Hub.....₩ dos $16.00
Cog-Wheel.....₩ dos $16.00
Easy.....₩ dos $22.00
Monarch.....₩ dos $22.00
Goshen.....₩ dos $21.00
Ladies' Friend.....₩ dos $15.00
Advance.....₩ dos $18.00
Supreme.....₩ dos $22.00

Tacks, Brads, &c.—

List October 19, 1889. Old established standard Weights Short Weight goods are sold at lower prices.

Carpet Tacks—
American, Blued.....
American, Tin'd and Cop'd.....
Steel, Bright and Blued.....
Steel, Tinned and Coppered .....
Swedes Iron, Blued. .....
Swedes Iron, Tinned.....
American Iron Tacks.....
Swedes Iron Tacks—
S. S., Blued.....
S. S., Tinned.....
Lanc., Blued.....
Lanc., Tinned.....
Gimp and Lace Tacks—
S. S., Blued.....
S. S., Tinned.....
Lanc., Blued.....
Lanc., Tinned.....
Basket and Trimmers' Tacks—
Lanc.....
S. S.....
Hungarian Nails.....
Miners' Tacks, S. S. .....
Miners' Tacks, Lanc .....
Common and Patent Brads.....
Leathered Tacks.....
Brush Tacks.....
Looking Glass Tacks.....
Picture-Frame Points.....
Finishing Nails.....
Trunk and Clout Nails—
Black.....
Tinned or Coppered.....
Basket Nails .....
Chair Nails.....
Cigar-Box Nails .....
Tin Capped Nails.....

Miscellaneous—

D'ble-Point..12⅟ count55&10@55&10&10%
Double Point, 100 count.....90%
Wire Carpet Nails. .....50&10%
Plymouth Rock Steel Carpet Tacks..25%
Wire Brads and Nails, see Nails, Wire.
Steel-Wire Brads, R. & E. Mfg. Co.'s list..... .....50&10%

See Trade Report for new discounts.

Tapes, Measuring—

American.....40@40&5%
Spring.....40%
Chesterman's, Regular list.....25@30%

Thermometers—

Tin Case.....30@30&10%

Thimble Skeins—See Skeins.

Ties, Bale—See Standard Wire, list.....50&10&5%

Tinners' Shears, &c.—See Shear Tinners', &c

Tinware—
Stamped, Japanned and Pieced, list Jan. 29 1887.....70&10@70&25%

Tire Benders, Upsetters, &c—
See Benders and Upsetters, Tire.

Tools.
Coopers'—
Bradley's.....20%
Barton's.....30@30&5%
L. & I. J. White.....30&5%
Albertson Mfg. Co.....25%
Beatty's.....30%
Sandusky Tool Co.....30@30&5%
Shaves, Cincinnati Tool Co.....20%

Lumber.
Ring Peavies, "Blue Line"...₩ dos $20.00
Ring Peavies, Common.....₩ dos $18.00
Steel Socket Peavies.....₩ dos $21.00
Mail. Iron Socket Peavies...₩ dos $19.00
Cant Hooks, "Blue Line"...₩ dos $16.00
Cant Hooks, Common Finish..₩ dos $14.00
Cant Hooks, Mail. Socket Clasp, "Blue Line" Finish.....$16.00
Cant Hooks, Mail. Socket Clasp, Common Finish.....₩ dos $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish.....₩ dos $14.00
Cant Hooks, Clip Clasp, Common Finish.....₩ dos $12.00
Hand Spikes....₩ dos 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ₩ dos., 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₩ dos, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₩ dos, 12 ft. $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₩ dos, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00
Swamp Hooks.....₩ dos $18.00

Saw.
Atkins' Perfection.....₩ dos $12.00
Atkins' Excelsior.....₩ dos $6.00
Atkins' Giant.....₩ dos $4.00

Tobacco Cutters—See Cutters, Tobacco.

Transom Lifters — See Lifters, Transom.

Traps—
Game—
Newhouse.....40@40&5%
Oneida Pattern.....70&10%
Game, Blake's Patent.....40&10&5%
Mouse and Rat—
Mouse Wood, Choker, ₩ dos holes, 9@10¢
Mouse, Round Wire.....₩ dos $1.50 10%
Mouse, Cage, Wire.....₩ dos $2.50, 10%
Mouse, Catch-'em-alive....₩ dz $2.50' 15¢
Mouse, Bonanza.....₩ dos $0.90@$1.00
Rat, Decoy.....₩ gr $10.00, 10%
Ideal.....₩ gr $10.00
Cyclone.....₩ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps. ₩ dos., 75¢; in full cases, ₩ dos 60@65¢
Hotchkiss Imp. Rat Killer...₩ gro $18.50
Hotchkiss New Rat Killer...₩ gro $16.50
Schuyler's Rat Killer.....₩ gro $18.00

Triers—
Butter and cheese.....25%

Trimmers, Spoke.
Bonney's.....₩ dos $10.00, 50%
Stearns'.....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₩ dos. 55&10%
Douglas'.....₩ dos $9.00, 20%
Cincinnati.....25%

Trowels—
Lothrop's Brick and Plastering.....20&10&5@35%
Reed's Brick and Plastering.....15%
Disston's Br'k and Plastering.....20%
Peace's Plastering.....25%
Clement & Maynard's.....20%
Rose's Brick.....15@20%
Brade's Brick.....25%
Worrall's Brick and Plastering.....20%
Garden.....70¢
Cleves' Angle Trowel, ₩ gro. $15, net @10¢

Trucks, Warehouse, &c.—
B. & L. Block Co.'s list, '82.....40%

Tubes, Boiler—
See Pipe.

Twine—

Flax Twine—	BC.	B.
No. 9, ¼ and ⅛ ℔ Balls	25¢	31¢
No. 12, ¼ and ⅛ ℔ Balls	22¢	30¢
No. 18, ¼ and ⅛ ℔ Balls	20¢	29¢
No. 24, ¼ and ⅛ ℔ Balls	20¢	29¢
No. 36, ¼ and ⅛ ℔ Balls	18¢	28¢
No. 264, Mattrass, ¼ and ⅛ ℔ Balls	52@54¢	
Chalk Line, Cotton, ⅛ ℔ Balls	25¢	
Mason Line, Linen, ⅛ ℔ Balls	55¢	
2-Ply Hemp, ¼ and ⅛ ℔ Balls (Spring Twine)	15½¢	
3-Ply Hemp, 1 ℔ Balls	16¢@16½¢	
3-Ply Hemp, 1¼ ℔ Balls	15¢@15½¢	
Cotton Wrapping, 5 Balls to ℔	15¢@16¢	
2, 3, 4 and 5-Ply Jute, ⅛ ℔ Balls	10¢	
Wool	6½@6¾¢	
Paper	13¢@14¢	
Cotton Mops, 6, 9, 12 and 15 ℔ to doz.	18¢	

Vises—
Solid Box.....50&10@50&10&5%
Parallel—
Fisher & Norris Double Screw.....15&10%
Stephens'.....25&30%
Parker's.....20@25%
Wilson's.....55%
Howard's.....40%
Bonney's.....40&10%
Millers Falls.....40@40&10%
Trenton.....40&5@40&10%
Merrill's.....15@20%
Sargent's.....60&10&10%
Backus and Union.....40%
Double Screw Leg.....15&10%
Prentiss.....20@25%
Simpson's Adjustable.....40%
Moore's.....20%
Massey Quick Action.....20 @ 25 %
Saw Filers—
Bonney's, Nos. 2 & 3, $15.00.....40&10%
Stearn's.....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises.....33⅓&35%
Sargent's.....66⅔&10%
Hopkins'.....₩ dos $17.50, 10%
Reading.....40&10%
Wentworth.....20&10%
Miscellaneous.
Combination Hand Vises.....₩ gr $42.00
Cowell Hand Vises.....20%
Bauer's Pipe Vises.....10%
Cincinnati.....25&10%
Enterprise Pipe Vises, each.....$3.00
Massey Combination Pipe.....40 %

Wads—Price per M.

U.M.C.&W.R.A.—B.E., 11 up..	68¢
U.M.C.&W.R.A.—B.E., 9&10..	82¢
U.M.C.&W.R.A.—B.E., 8.....	96¢
U.M.C.&W.R.A.—B.E., 7.....	$1.10
U.M.C.&W.R.A.—P.E., 11 up..	1.15
U.M.C.&W.R.A.—P.E., 9&10..	1.50
U.M.C.&W.R.A.—P.E., 8.....	1.70
U.M.C.&W.R.A.—P.E., 7.....	1.80
Eley's B. E., 11 up.....	$1.70@$1.75
Eley's P. E., 11@10.....	3.00@3.25

Dis. 50&2

Wagon Boxes—See Boxes, Wagon.

Washer Cutters—See Cutters Washer.

Wagon Jacks—See Jacks, Wagon.

Ware, Hollow, Enameled, &c.
Cast Iron, Hollow—
Stove Hollow-Ware—
Ground.....60&10%
Unground.....60&10&10%
White Enameled-Ware—
Maslin Kettles.....75@75&5%
Boilers and Saucepans.....60@60&5%
Tinned Boilers and S'pans.....60@60&5%
Rustless Hollow-Ware.....50@50&5%
Gray Enameled-Ware—
Stove.....50%
Maslin Kettles.....60&10&10%
Boilers and Saucepans.....40&5%
Enameled—
Agate and Granite Ware, list Jan. 1, 1889.....33⅓&10%
Ironclad Enameled Ware...dis 33⅓&10%
Kettles—
Galvanized Tea-Kettles—

Inch....	6	7	8	9
Each....	55¢	60¢		75¢

Standard Fiber—

	Per Dozen. Plain.	Dec'r'd
Wash-Basins, 10½ in.	$2.00	$2.25
Wash-Basins, 12 in.	2.25	2.75
Keelers, 11½ in.		4.00
Cuspidors.		3.00
Spittoons, "Daisy," 8 in....	4.00	4.50
Peck Measures.	4.00	
Half-peck Measure.	3.50	

See also Pails.
Indurated Fiber—25%
Spittoons, No. 2, ₩ doz.....$3.40
Basins, flinged, ₩ doz., No. 2.....3.00
Washtubs, Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₩ nest.....7.50
Keelers Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₩ nest.....3.90
Butter Bowls 15, 17 and 19-inch (3 pieces), ₩ nest.....1.70
Liquid Measures, pt., qt., 2 qt. and funnell (4 pieces) ₩ set.....1.60
See also *Pails.*
Silver Plated, Hollow—
4 mo. or 5 % cash in 30 days.
Reed & Barton, Meriden Britannia Co., Simpson, Hall, Miller & Co., Rogers & Brother, Hartford Silver Plate Co, William Rogers Mfg. Co.....40&5%

Washers—

Size hole.....	5-16	⅜	½	⅝	to 1¾
Washers.....	6	5	3.50¢	3	

In lots less than 200 ℔, ₩ ℔, add ¼¢, 5-℔ boxes 1¢ to list.

Wedges—
Iron.....₩ ℔ 3½¢
Steel.....₩ ℔ 3½¢

Weights, Sash—
Solid Eyes.....₩ ton $18@$19

Well Buckets, Galvanized—See Buckets, Well, Galvanized.

Wheels, Well.
8 in., $2.25; 10 in., $2.70; 12 in., $3.20

Wire and Wire Goods—
Iron—
Market.
Br. & Ann., Nos. 0 to 18.. 75&10@80&5%
Cop'd, Nos. 0 to 18.....75&5@75&10%
Galv., Nos. 0 to 18.....70@70&10%
Tin'd, Tin'd list Nos. 0 to 18 70@70&10%
Stone.
Br. and Ann'd, Nos. 16 to 18.....70%
Bright and Ann'd, Nos. 19 to 26..80 &5%
Br. and Ann'd, Nos. 27 to 36...82½ 5%
Tinned.....
Tinned Broom Wire .18 to 21, ₩ ℔. 4½¢
Galvanized Fence, Nos. 8 and 9..70&10%
Brass, list Jan. 18, 1884.....25@33⅓%
Copper, list Jan. 18, 1884.....33⅓@40%
Annealed Wire on Spools.....60%
Malin's Steel and Tin'd on Spools.....60%
Malin's Brass and Cop. on Spools.....50%
Tate's Spooled, Tin'd & Annealed..60&5%
Tate's Spooled Cop. and Brass.....50%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to $, 30%
Steel Music Wire, 12 to 20...60@70¢ ₩ ℔
Wire Clothes Lines, see Lines.
Wire Picture Cord see cord.

Bright Wire Goods—
Standard list.....25%

Wire Cloth and Netting.
Painted Screen Cloth, good quality ₩ 100 sq. ft., $1.40
Galvanized Wire Netting.....70&10@75%

Wire, Barb.—Prices unsettled. See Irade Report.

Wire Rope—See Rope, Wire.

Wrenches—
American Adjustable.....40%
Baxter's Adjustable "S".....40&10@50%
Baxter's Diagonal.....40&10@50%
Coes' Genuine.....50&2%
Coes' "Mechanics".....50&10&2%
Girard Standard.....65&10%
Lamson & Sessions' Engineers'..60&10%
Lamson & Sessions' Standard....70&10%
P. S. & W. Agricultural, Girard Agricultural, Lamson & Sessions' Agric'l..75&10@70&10&2%
Bemis & Call's Pat. Combination.....35%
Merrick's Pattern.....35%
Brigg's Pattern.....25%
Cylinder or Gas Pipe.....40&5%
No. 3 Pipe.....40&10%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....₩ doz $4.00, 40%
Webster's Pat. Combination.....35%
Boardman's.....30&10%
Always Ready.....25&2%
Alligator.....50%
Donohue's Engineer.....20&10%
Acme, Bright.....50&2%
Acme, Nickeled.....40&2%
Hercules.....70%
Walker's.....55&2%
Diamond Steel.....55&2%
Cincinnati Brace Wrenches.....25&10%
Tafts' Vise Wrench.....55&10&2%

Wringers, Clothes—
Am. Wringer Co.'s list, July 15, 91..2% cash
Colby Wringer Co., list Sept. 1, '91.2% cash
Lovell Mfg. Co., list Jan. 1, 1892.2 ¢ cash
Peerless Mfg. Co, list Feb., 1892..2% cash

Wrought Goods—
Staples, Hooks, &c., list March 17, 1892 20&2.5

PAINTS, OILS AND COLORS.—Wholesale Prices.

Animal and Vegetable Oils.

Linseed, City, raw..per gal.	29	@	..
Linseed, City, boiled.....	4	@	..
Linseed, Western, raw.....	28	@	
Lard, City, Extra Winter..	57	@	58
Lard, City, Prime.....	56	@	57
Lard, City, Extra No. 1.....	44	@	45
Lard, City, No. 1.....	40	@	42
Lard, Western, prime.....	55	@	56
Cotton-seed, Crude, prime,	24½	@	25
Cotton-seed, Crude, off grades.....	23½	@	23½
Cotton-seed, Summer Yellow, prime.....	28½	@	29
Cotton-seed, Summer Yellow, off grades.....	27	@	28
Sperm, Crude.....	69	@	70
Sperm, Natural Spring.....	67	@	70
Sperm, Bleached Spring....	72	@	75
Sperm, Natural Winter.....	73	@	76
Sperm, Bleached Winter...	78	@	81
Whale, Crude.....	..	@	45
Whale, Natural Winter.....	54	@	55
Whale, Bleached Winter...	57	@	58
Whale, Extra Bleached.....	59	@	60
Sea, Elephant, Bleached Winter.....	62	@	63
Menhaden, Crude, Sound...	30	@	32
Menhaden, Crude, Southern	..	@	..
Menhaden, Light Pressed..	37	@	38
Menhaden, Bleached W'ter.	38	@	39
Menhaden, Extra Bleached	40	@	42
Tallow, City, prime.....	44	@	45
Tallow, Western, prime....	42½	@	43
Cocoanut, Ceylon.....	5¾	@	6⅛
Cocoanut, Cochin.....	6¾	@	6¾
Cod, Domestic.....	38	@	40
Cod, Foreign.....	43	@	45
Red Elaine.....	34	@	36
Red Saponified.....₩ ℔	4½	@	5
Bank.....per gal	35	@	36
Straits.....	36	@	37
Olive, Italian, bbls.....	60	@	62
Neatsfoot, prime.....	50	@	60
Palm, prime, Lagos....₩ ℔	6	@	6⅛

Mineral Oils.

Black, 29 gravity, 25 @ 30 cold test.....per gal	7	@	7½
Black, 29 gravity, 15 cold test.....	8	@	8½
Black, 29 gravity, summer.	6	@	6½
Cylinder, dark, filtered....	12	@	15
Paraffine, 23½ @ 24 gravity.	13½	@	14
Paraffine, 25 gravity.....	12½	@	13
Paraffine, 28 gravity.....	8	@	9½
Paraffine, red, 23½@24 gr'ty	13	@	14

Paints and Colors.

Barytes, Foreign, ₩ ton.	$22.00	@	24.00
Barytes, Amer. floated...	30.00	@	32.00
Barytes, Amer. No. 1....	17.00	@	19.00
Barytes, Amer. No. 2....	13.00	@	16.00
Barytes, Amer., No. 3....	11.00	@	12.00
Blue, Celestial.....₩ ℔	6	@	8
Blue, Chinese.....	40	@	50
Blue Prussian.....	25	@	40
Blue, Ultramarine.....	8	@	25
Brown, Spanish.....	½@		1
Brown, Vandyke, Amer..	3	@	3½
Brown, Vandyke, English	6	@	8
Carmine, No. 40, in bulk.	3.10	@	..
Carmine, No. 40, in boxes or barrels.....	3.20	@	.
Carmine, No. 40, in ounce bottles.....	4.20	@	.
Chalk, in bulk.....₩ ton.	1.40	@	1.75
Chalk, in bbls., ₩ 100 ℔.	33	@	40
China Clay, English.....	₩ ton. 13.00	@	18.00
Cobalt Oxide, prep'd....	9.00	@	11.00
Cobalt Oxide, black.. lots 100℔	2.50	@	....
Cobalt, Oxide, black..... less 100℔	2.65	@	2.90
Green, Paris, in bulk.....	14	@	15½
Green Paris, 170 @ 175 ℔ kegs.....	14½@		15¾
Green, Paris, small pack.	16	@	21¾
Green, Chrome, ordinary	6	@	12
Green, Chrome, pure...	22	@	25
Lead, Eng., R.B. white..	8½@		10
Lead, Amn. White, dry or in oil: Kegs, lots less than 500 ℔...	7¼	@	7¾
Kegs, lots 500 ℔ to 5 tons....	6¾	@	7
Kegs, lots 5 tons to 12 tons..	6½	@	6¾
Kegs, lots 12 tons and over..	6¼	@	6¾
Lead White in oil 25 ℔ tin pails add to keg price.....		@	⅛
Lead, White, in oil, 12½ ℔ tin pails, add to keg price		@	¼
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price.		@	2½
Lead, Red, bbls. and ½ bbls....	6¼	@	7½
Lead Red, kegs.....	6¼	@	7¾
Litharge, kegs.....	6¼	@	7½
Litharge, bbls. and ½ bbls.....	6¼	@	7½

Terms, &c.—Lead and Litharge.—On lots of 500 ℔ or over, 60 days' time or 2½ % discount for cash if paid within 15 days of date of invoice.

Ocher, Rochelle.....	1.35	@	1½
Ocher, French Washed....	1½@		2½
Ocher, German Washed....	1½@		3
Ocher, American.....	½@		1½
Orange Mineral, English...	8½@		9
Orange Mineral, French....	10	@	10½
Orange Mineral, German ..	8½@		09
Orange Mineral, American.	1½@		1¾
Paris White, English Cliff-stone.....	1.00	@	1.15
Paris White, American.....	70	@	75
Red, Indian, English.....	5½@		7
Red, Indian, American.....	2	@	6½
Red, Turkey.....	9	@	14
Red, Tuscan.....	9	@	11
Red, Venetian, American.. ₩ 100 ℔.	1.00	@	1.10
Red, Venetian, English....	1.20	@	1.30
Sienna, Italian, Burnt and Powd.₩ ℔	4	@	5
Sienna, Ital., Burnt Lumps	1¼@		3½
Sienna, Ital., Raw, Powd..	4½@		5½
Sienna, Ital., Raw Lumps..	1¾@		3½
Sienna, American, Raw....	1½@		1¾
Sienna, American, Burnt and Powdered.....	1¼@		1¾
Talc, French.....	1¾@		1¾
Talc, American.....	0½@		1¼
Terra Alba, Fr'ch. ₩ 100 ℔	75	@	80
Terra Alba, English	70	@	75
Terra Alba, American No.1	70	@	75
Terra Alba, American No.2	45	@	50
Umber, Turkey, Bnt. and Powd..... ₩ ℔	3½@		4
Umber, Turkey Bnt.Ln	2½@		3
Umber, Turkey, Raw and Powdered.....	3½@		
Umber, Turkey, R'w Lmps	2½@		2¾
Umber, Turkey, Bnt. Amer.	1½@		1¾
Umber, Turkey, R'w Amer.	1½@		1¾
Yellow, Chrome.....	10	@	23
Vermillion Americ. Lead..	11½@		17
Vermillion, Quicks'er, bulk.	60	@	62
Vermillion, Quicks'er, bags.	61	@	63
Vermillion Quicksilver, smaller pkgs.....	65	@	67
Vermillion English Import	85	@	90
Vermillion, Imitation, Eng.	8	@	25
Vermillion, Trieste.....	90	@	92½
Vermillion, Chinese.....	92½@		95
Whiting, Common, ₩ 100 ℔	35	@	45
Whiting, Gilders'.....	40	@	60
Zinc, American, dry....₩ ℔	4½@		5
Zinc, French, Red Seal.....	..	@	5½
Zinc, French, Green Seal..	..	@	5½
Zinc, French, V. M. X....	..	@	7
Zinc, Antwerp, Red Seal...	..	@	7½
Zinc, Antwerp, Green Seal	..	@	8½
Zinc, German, L. Z. O....	..	@	6¾
Zinc, V M. in Poppy Oil, G. Seal, lots of 1 ton and over.....	10½@		11¼
lots less than 1 ton	11	@	11¾
Zinc. V. M. in Poppy Oil, Red Seal,.....	10	@	..
lots of 1 ton and over....	10	@	10¼
Lots of less than 1 ton....	10½@		10¾

Discounts.—French Zinc.—Discounts to buyers of 10- bbl. lots of one or assorted grades, 1 %; 25 bbls. 2 %, 50 bbls. 4 %. No discount allowed on less than bbl. lots.

Colors in Oil.

Black, Drop, Frankfort	25	@	30
Black, Drop, English.....	12	@	15
Black, Drop, Domestic	7	@	10
Black, Lampblack, Best....	20	@	35
Black, Lampblack, Common	7	@	18
Black, Ivory.....	8	@	15
Blue, Chinese.....	35	@	40
Blue, Prussian.....	20	@	45
Blue, Ultramarine.....	12	@	15
Brown, Vandyke.....	7	@	12
Green, Chrome.....	8	@	13
Green, Paris.....	16	@	18½
Sienna, Raw.....	7	@	14
Sienna, Burnt.....	7	@	14
Umber, Raw.....	7	@	10
Umber, Burnt	7	@	10

Putty.

In barrels and ½ bbls.....	.01½	@	.01¾
In tubs.....	.01¾@		.02
In tin cans.....	.01¾@		.02½
In bladders.....	.01¾@		.02¾

Spirits Turpentine.

In regular bbls.....	38	@	..
In machine bbls.....	38	@	38½

Glue.

Low Grade.....₩ ℔	8	@	10
Cabinet.....	12	@	14
Medium White.....	13	@	15
Extra White.....	17	@	20
French.....	10	@	22
English.....	10	@	15
Irish.....	12	@	

CURRENT METAL PRICES.

APRIL 6, 1892.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports

IRON AND STEEL.

Bar Iron from Store.

Common Iron:	
⅜ to 2 in. round and square.. 1 to 6 in. x ⅜ to 1 in...	₩ ℔ 1.90 @ 2.00¢
Refined Iron:	
⅜ to 2 in. round and square. 1 to 4 in. x ⅜ to 1¼ in... 4¼ to 6 in. x ⅜ to 1 in.	₩ ℔ 2.00 @ 2.20¢
1 to 6 in. x ¼ and 5-16	₩ ℔ 2.20 @ 2.40¢
Rods—⅜ and 11-16 round and sq.	₩ ℔ 2.10 @ 2.30¢
Bands—1 to 6 x 3-16 to No. 12	₩ ℔ 2.30 @ 2.50¢
"Burden Best" Iron, base price.	₩ ℔ 3.00¢
Burden's "H. B. & S." Iron, base price	₩ ℔ 2.80¢
"Ulster"	₩ ℔ 3.00¢
Norway Bars	3.75 @ 4.00¢
Norway Shapes	4.50 @ 5.00¢

Merchant Steel from Store.

	Per pound
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots	2¾¢
Best Cast Steel, base price in small lots	8 ¢
Best Cast Steel Machinery, base price in small lots	5 ¢

Sheet Iron from Store.

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ ℔ 3 @	3½¢
17 to 20	₩ ℔ 3⅛ @	3⅜¢
21 to 24	₩ ℔ 3¼ @	3⅝¢
25 and 26	₩ ℔ 3⅜ @	3¾¢
27	₩ ℔ 3½ @	3⅞¢
28	₩ ℔ 3⅝ @	4 ¢
American B. B.	₩ ℔ 4¢ @ 4¼¢	

Galvanized Sheet Iron.

	B. B.	2d qual
Nos. 10 to 16	₩ ℔ 4.20¢	4 ¢
17 to 22	₩ ℔ 4.60¢	4.30¢
23 to 24	₩ ℔ 4.90¢	4.70¢
25 to 26	₩ ℔ 5.30¢	5 ¢
27	₩ ℔ 5.60¢	5.30¢
28	₩ ℔ 6 ¢	5.70¢
29 to 30	₩ ℔ 7 ¢	6.70¢
Genuine Russia, according to assortment	₩ ℔ 11¼¢ @ 11½¢	
Patent Planished	₩ ℔ A, 10¢; B, 9¢	
Craig Polished Sheet Steel	₩ ℔, 8½¢	

English Steel from Store.

Best Cast	₩ ℔ 15 ¢
Extra Cast	₩ ℔ 16½ @ 17 ¢
Swaged. Cast	₩ ℔ 16 ¢
Best Double Shear	₩ ℔ 15 ¢
Blister, 1st quality	₩ ℔ 12 ¢
German Steel, Best	₩ ℔ 10 ¢
2d quality	₩ ℔ 9 ¢
3d quality	₩ ℔ 8 ¢
Sheet Cast Steel, 1st quality	₩ ℔ 15 ¢
2d quality	₩ ℔ 14 ¢
3d quality	₩ ℔ 12½¢
R. Mushet's "Special"	₩ ℔ 48 ¢
" " "Titanic"	₩ ℔ 20 ¢

METALS.

Tin.

	Per ℔
Banca, Pigs	22 @ .¢
Straits, Pigs	21 @21½¢
Straits in Bars	23 ⅝

Tin Plates.

Duty: 2.2 cents per pound.

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality. Per box.

Melyn and Calland Grade.	IC, 10	x14..	@ $6.50
" " "	IC, 12	x12..	@ 6.75
" " "	IC, 14	x20..	@ 6.50
" " "	IC, 20	x28..	@ 13.00
" " "	IX, 10	x14..	@ 8.50
" " "	IX, 12	x12 .	@ 8.75
" " "	IX, 14	x20 .	@ 8.50
" " "	IX, 20	x28..	@ 17.00
" " "	DC, 12½	x17..	@ 6.00
" " "	DX 12½	x17..	@ 8.00
Allaway Grade	IC, 10	x14..	@ 6.00
" "	IC, 12	x12..	@ 6.25
" "	IC, 14	x20..	@ 6.00
" "	IC, 20	x28..	@12.00
" "	IX, 10	x14..	@ 7.50
" "	IX, 12	x12..	@ 7.75
" "	IX, 14	x20..	@ 7.50
" "	IX, 20	x28..	@15.00
" "	DC, 12½	x17..	@ 5.50
" "	DX, 12½	x17..	@ 7.00

Coke Plates.—Bright.

Steel Coke.—IC, 10 x 14, 14 x 20..	$5.70	@ $5.75
10 x 20..	..	@ 8.50
20 x 28..	11.50	@ 12.00
IX, 10 x 14, 14 x 20..	....	@ 7.00
BV Grade.—IC, 10 x 14, 14 x 20..	....	@ 5.75

Charcoal Plates.—Terne.

Guaranteed Plates command special prices according to quality.

Dean Grade.—IC, 14 x 20	....	@ $5.75
20 x 28	....	@ 11.00
IX, 14 x 20	....	@ 6.50
20 x 28	....	@ 13.00
Abecarne Grade.—IC, 14 x 20	....	@ 5 65
20 x 28	10.75	@ 11.00
IX 14 x 20	..	@ 6 50
20 x 28	....	@ 13 00

Tin Boiler Plates.

I C, 14 x 26 112 sheets	@ $13.35
X X, 14 x 28 112 sheets	@ 14.50
I C X 14 x 31 112 sheets	@ 16.00

Copper.

Duty: Pig, Bar and Ingot, 1¼¢; Old Copper, 1¢ ₩ ℔. Manufactured (including all articles of which Copper is a component of chief value), 35 % ad valorem.

Ingot

Lake	@ 13 ¢
Ansonia Grade Arizona	@ 12¼¢
Ansonia Grade Casting	@ 12¼¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, December 5, 1890. Subject to a discount of 10 % @ 20 %, according to size of order.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	—	72	22	22	22	23	24	25	28	30
30	—	72	22	22	22	23	25	27	31	....
36	—	96	22	22	22	24	26	30	33	....
36	—	96	22	22	23	25	27	31	35	....
48	—	96	22	22	24	26	28	32	....	....
48	—	96	22	22	25	27	29	33	....	....
60	—	96	22	22	25	27	29	34	....	....
60	—	96	23	23	26	28	....	....	....	....
84	—	96	23	24	....	....	....	....	....	....
84	—	96	24	25	....	....	....	....	....	....
Over 84 in. wide			25	27	....	....	....	....	....	....

Bolt Copper, ⅝ inch diameter and over, per pound 22¢

Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness

Cold or Hard Rolled Copper 14 oz. ₩ square foot and heavier, 1¢ ₩ ℔ over the foregoing prices.

Cold or Hard Rolled Copper lighter than 14 oz. ₩ square foot, 2¢ ₩ ℔ over the foregoing prices.

Copper Bottoms, Pits and Flats.

	Per pound
14 ounce to square foot and heavier	26¢
12 ounce and up to 14 ounce to square foot	27¢
10 ounce and up to 12 ounce	29¢
Lighter than 10 ounce	32¢

Circles less than 8 inches diameter 2 cents per pound additional.

Circles over 13 inches diameter are not classed as Copper Bottoms.

10 % discount.

Copper Wash Bowl Bottoms.

Tinned ₩ ℔ 34¢, 10%

Tinning.

Net.

Tinning sheets on one side, 10, 12 and 14 x 48 each	8¢
Tinning sheets on one side, 30 x 60 each	30¢
For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each	15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each	12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each	12¢
Tinning sheets on one side, other sizes, per square foot	2½¢
For tinning both sides double the above prices.	

Planished Brass and Copper.

Not larger than 30 x 60.

16 oz. and heavier	24¢ ₩ ℔
14 oz.	25¢ ₩ ℔
12 oz.	27¢ ₩ ℔

Seamless Brass Tubes.

Net.

Dec. 16, 1891.

O. G.	N. G.	⅜	⅓	⅝	½	⅝	¾	1	1¼
8-14	6-12	30	26	23	22	21	20	17	
15	13	31	26	24	23	22	21	18	
16	14	32	27	25	24	23	22	18	
17	15	33	28	26	23	24	23	19	
18	16	35	29	27	25	24	23	20	
19	17	36	30	28	27	26	25	22	
20	18-19	37	32	30	29	28	27	24	
21	20	39	34	32	31	30	29	27	
22	21	41	35	34	32	31	30	29	
23	22	43	37	35	34	33	32	32	
24	23	46	39	37	36	34	33	34	
25	24	49	42	39	38	37	36	38	

Copper Tubes, 3¢ ₩ ℔ additional.

Copper Bronze and Gilding Tube, 3¢ ₩ ℔ additional.

Brazed Brass Tubing. (To No. 20, inclusive.

Above 5-16 inch to 3 inch, inclusive	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	1.50
Fancy Tubing, Brass, to No. 20, inclusive	45¢ ₩ ℔
Bronze Tubing, 3¢ ₩ ℔ more than Brass.	
Discount from list	30 @ .. %

Roll and Sheet Brass.

(Brown & Sharps Standard Gauge.)

Common High Brass: Wider than and including	in. 2 / 10	in. 10 / 12	in. 12 / 14	in. 14 / 16	in. 16 / 18	in. 18 / 20	in. 20 / 22	in. 22 / 24
To No. 20, inclusive	.21	.22	.23	.25	.27	.29	.31	.33
Nos. 21, 22, 23 and 24	.22	.23	.24	.26	.28	.30	.32	.34
Nos. 25 and 26	.23½	.23¾	.24½	.27	.29	.31	.33	.35
Nos. 27 and 28	.23	.24	.25	.28	.30	.32	.34	.36

Common High Brass: Wider than and including	in. 24 / 26	in. 26 / 28	in. 28 / 30	in. 30 / 32	in. 32 / 34	in. 34 / 36	in. 36 / 38	in. 38 / 40
To No. 20, inclusive	.36	.39	.42	.46	.50	.55	.60	.65
Nos. 21, 22, 23 and 24	.37	.40	.43	.47	.51	.56	.61	.63
Nos. 25 and 26	.38	.41	.44	.48	.52	.57	.63	.71
Nos. 27 and 28	.39	.42	.45	.49	.53	.58	.65	.76

Discount from List 10 % to 25 %.

Brass and Copper Wire.

List January 17, 1884.

Numbered by Stubs' gauge.	Soft & hard high brass.	Spring high brass.	Low brass.	Copper.
All Nos. to No. 16, inclusive	$0.22	$0.24	$0 26	$0.30
No. 17 and No. 18	.23	.25	.27	.31
No. 19 " " 20	.24	.26	.28	.32
No. 21, or 0.032 diam	.25	.27	.29	.33

Discount 10 % to 25 %.

Fine Numbers.

Numbered by London gauge.	Brass.	Spring high brass.	Low brass.	Copper.
No. 22	$0.26	$0.28	$0 30	$0 34
No. 23	.28	.30	.32	.36
No. 24	.30	.32	.34	.38
No. 25	.32	.34	.36	.40
No. 26	.35	.37	.39	.43
No. 27	.38	.40	.42	.46
No. 28	.42	.44	.46	.51
No. 29	.45	.47	.49	.54
No. 30	.48	.50	.52	.62
No. 31	.51	.53	.55	.67
No. 32	.55	.57	.59	.75
No. 33	.59	.61	.63	.87
No. 34	.64	.66	.68	.98
No. 35	.70	.72	.74	1.30
No. 36	.76	.78	.80	1.50
No. 37	1.00	1.02	1.04	1.70
No. 38	1.30	1.32	1.34	2.00
No. 39	2.00	2.02	2.00	3.25
No. 40	2.60	2.62	2.60	5.75

— % discount.

Spring Wire, 2¢ ₩ ℔ advance.

Copper Belt and Hose Rivets and Burrs.

Per ℔.		Per ℔.	
No. 5	49¢	No. 11	56¢
No. 6	49¢	No. 12	58¢
No. 7	49¢	No. 13	60¢
No. 8	50¢	No. 14	65¢
No. 9	52¢	No 15	70¢
No 10	54¢		

60 % @ 10 % discount.

Tobin Bronze—Rods.

Drawn Rods for Bolts, Forgings, &c.

¼ to ⅜ inch inclusive	18¢ ₩ ℔
Over ⅜ to 3½ inches inclusive	17¢ ₩ ℔
Over 3½ to 5 inches inclusive	17¢ ₩ ℔

Piston Rods, Finished True, Smooth and Straight

¼ to ⅜ inch inclusive	19¢ ₩ ℔
Over ⅜ to 2 inches inclusive	18¢ ₩ ℔
Over 2 to 3½ inches inclusive	19¢ ₩ ℔
Over 3½ to 5 inches inclusive	2 ¢ ₩ ℔

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₩ 100 ℔

Western Spelter	5¢@5¼¢
Bertha (pure)	8 ¢

Zinc.

Duty; Sheet, 2½¢ ₩ ℔.

600 ℔ casks	6¾¢
Per ℔	7 ¢

Lead.

Duty: Pig, $2 ₩ 100 ℔. Old Lead, 2¢ ₩ ℔. Pipe and Sheets 2½¢ ₩ ℔.

American Pig	4½¢
Bar	5 ¢
Pipe, subject to discount 20 %	6½¢
Tin-Lined Pipe, subject to discount 20 %	15¢
Block Tin Pipes, subject to discount 20 %	37½¢
Sheet, subject to discount 20 %	7¢

Old Lead in exchange, 3 ¼¢ ₩ ℔.

Solder.

½ @ ½ (Guaranteed)	13½¢
No. 1	11¼ 11¾¢
Extra Wiping	12 @12½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson	₩ ℔ 15½@ 16 ¢
Hallett's	" .... @ 12½¢

ALUMINUM.

Prices Per Ton.

Duty: 15 cents per pound.

Over 98 % pure	₩ ℔ .75
94 % @ 98 % pure	₩ ℔ .65

Old Metals.

Prices Paid in New York.

Heavy Copper	₩ ℔ 10 ¢
Light Copper	₩ ℔ 9 ¢
Heavy Brass	₩ ℔ 7 ¢
Light Brass	₩ ℔ 6 ¢
Lead	₩ ℔ 3½¢
Tea Lead	₩ ℔ 3½¢
Zinc	₩ ℔ 2½¢
No. 1 Pewter	₩ ℔ 14 ¢
No 2 Pewter	₩ ℔ 7 ¢
Wrought Scrap Iron	₩ gross ton $17.00
Heavy Cast Scrap	₩ gross ton 10.00
Stove Plate Scrap	₩ gross ton 7.00
Burnt Iron	₩ gross ton 5.50